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MASSACHUSETTS DEPARTMENT OF EDUCATION
MCAS

MASSACHUSETTS
COMPREHENSIVE
ASSESSMENT
SYSTEM

Overview of the MCAS 2001 Tests

February 2001
Massachusetts Department of Education

Massachusetts

"We help children learn."

Department of Education

Massachusetts Department of Education

This document was prepared by the Massachusetts Department of Education.
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Commissioner's Foreword

Dear Colleagues:

In preparation for the fourth administration of the Massachusetts Comprehensive Assessment System state tests, I am pleased to present *The Massachusetts Comprehensive Assessment System: Overview of the MCAS 2001 Tests*. The design of MCAS tests remains essentially the same, but there are some important changes to the MCAS testing schedule as we prepare to test across different grade levels this year.

We also intend this overview to help schools implement the Massachusetts *Curriculum Frameworks*. I believe that teachers and administrators will find the information on MCAS tests and the sample materials provided in this publication to be especially helpful in their effort to bring the learning standards to life in classrooms throughout Massachusetts.

Sincerely,

David P. Driscoll
Commissioner of Education

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I. Purpose and Structure of This Document

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Document Purpose

The purpose of this document is to provide local educators with an overview of the Massachusetts Comprehensive Assessment System (MCAS) 2001 tests, highlighting the new tests that will be administered for the first time in 2001.

This document provides

- information on recent refinements to selected Massachusetts *Curriculum Frameworks* and the effects of those changes on the MCAS 2001 tests
- details about test design for the MCAS 2001 tests
- sample test questions (items) for the MCAS tests being administered for the first time in 2001

Please note that some information in this document updates and supersedes information given in the previously published MCAS *Guides*. The *Guides* provide additional details on the content and structure of the MCAS tests in their respective content areas:

- *Guide to the Massachusetts Comprehensive Assessment System: English Language Arts* (February 1998)
- *Guide to the Massachusetts Comprehensive Assessment System: Mathematics* (January 1998)
- *Guide to the Massachusetts Comprehensive Assessment System: Science & Technology* (January 1998)
- *Guide to the Massachusetts Comprehensive Assessment System: History and Social Science, Spring 1999*

Document Structure

This first chapter explains the overall intent and structure of this document.

Chapter II provides an overview of the Massachusetts Comprehensive Assessment System and highlights updates related to the MCAS 2001 test administration.

Chapters III through VI each contain an overview of MCAS test specifications, administration, and features for one content area. Sample items are included for the tests being administered for the first time in 2001.

Important Note Regarding Sample Materials

The sample materials included in this document illustrate how *Framework* learning standards will be assessed by MCAS tests. Please note that these sample materials address only a select number of learning standards and do **not** represent the entire range of items that appear on actual MCAS tests.

Also note that these sample items are **not** formatted as they appear in actual MCAS test booklets, nor do they include all student directions or the amount of response space provided to students during test administration.

II. Overview of the Massachusetts Comprehensive Assessment System (MCAS)

II. Overview of the Massachusetts Comprehensive Assessment System (MCAS)

A. MCAS Overview

The Massachusetts Comprehensive Assessment System (MCAS) is the Commonwealth's statewide assessment program developed in response to the *Education Reform Law of 1993*. The primary purposes of MCAS are

- to measure the performance of individual students, schools, and districts based on the state standards outlined in the Massachusetts *Curriculum Frameworks*
- to raise student achievement
- to improve classroom instruction
- to determine competency in English language arts and mathematics in order to award high school diplomas

The 1993 Education Reform Law mandates that *all* students in the tested grades who are educated with Massachusetts public funds participate in MCAS, including

- students enrolled in public schools
- students enrolled in charter schools
- students enrolled in educational collaboratives
- students enrolled in private schools receiving special education that is publicly funded by the Commonwealth, including Chapter 766-approved private schools within and outside Massachusetts
- students receiving educational services in institutional settings
- students in the custody of either the Department of Social Services or the Department of Youth Services
- students with disabilities
- students with limited English proficiency[1]

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[1] LEP students who have been enrolled in United States schools for three or fewer years AND are ineligible to take the Spanish-language version of MCAS are not required to participate in MCAS testing. For further information, see the publication, *Requirements for the Participation of Students with Limited English Proficiency, (Spring 2000 Update).*

B. The MCAS 2001 Tests and Reporting

Massachusetts *Curriculum Frameworks*

Massachusetts students are tested by MCAS in the following content areas:

- English Language Arts (ELA)
- Mathematics
- Science and Technology/Engineering
- History and Social Science

MCAS tests are based exclusively on the learning standards (and, in History and Social Science, on core knowledge topics) contained in the Massachusetts *Curriculum Framework* for the content area tested.[2]

MCAS test questions (items) focus on general *Framework* learning standards and/or their corresponding grade-specific standards. Some items incorporate standards identified for preceding grade levels; consequently, students are often required to demonstrate cumulative content knowledge and skills (e.g., grade 10 students may be tested on learning standards identified in a *Framework* from pre-Kindergarten through grade 10).

Item Types

Four types of test items are used on MCAS tests:

- Multiple-choice questions are included on all MCAS tests except ELA Composition, and require students to select the correct answer from a list of four options.

  Multiple-choice items are machine-scored by optical scanners. Correct answers are assigned a score of 1 point and incorrect answers are assigned a score of 0 points.

- Open-response questions are included on all MCAS tests except ELA Composition, and require students to generate, rather than recognize, a response. Depending on the content area tested, students provide a written response of one or two paragraphs, or create a chart, table, diagram, or graph.

  Open-response items receive a score from 0-4, based on item-specific rubrics used by trained professional scorers.

- Short-answer questions are included only on MCAS Mathematics tests, and require students to generate a brief response, usually a numeric solution to a computation or a short statement.

  Short-answer items are scored by trained scorers. Based on an item-specific rubric, correct answers are assigned a score of 1 point and incorrect answers are assigned a score of 0 points.

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[2] Please note that certain learning standards, including all learning standards in the *English Language Arts Curriculum Framework*'s *Media* strand, cannot be assessed using a large-scale paper-and-pencil format, and are not assessed by MCAS.

- **Writing prompts** are included only on MCAS ELA Composition tests, and require students to respond by creating a written composition.

  ELA Compositions are scored in two areas by trained scorers:

  - Topic Development (2-12 points)
  - Standard English Conventions (2-8 points)

Common Items/Matrix-Sampled Items

Most MCAS Student Test Booklets are issued in several different forms at each grade level.[3] Approximately 80% of the test items in any test booklet are *identical* (**common items**) on all test forms. The remaining 20% of the test items in each test booklet *vary* (**matrix-sampled items**) from form to form.

Individual student test scores are based exclusively on **common items**.

Matrix-sampled items are used to equate test forms across MCAS administrations and to field-test items for possible future use as common items. In *School* and *District Reports*, the *Subject Area Subscore* pages include data generated from responses to both common and matrix-sampled items: this is the **only** instance in which matrix-sampled items are used to generate MCAS results. All other school and district results are generated from student responses to common items only.[4]

Untimed Test Sessions

MCAS tests are designed to be untimed. While the recommended time allotment per session should be adequate for most students, additional time is provided, *as necessary, for any student unable to complete a test session within the allotted time*. The amount of additional time per session **generally** considered to be reasonable may range from five minutes to 30 minutes.

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[3] The MCAS ELA Composition Student Test Booklet and the ELA Composition Make-Up Student Test Booklet are each issued in one form only, using different writing prompts; both prompts are considered common items.

In addition to the standard forms of all other content area test booklets, three non-standard versions of each booklet (large-print, Braille, and Spanish-language) are available for use by eligible students. For further information on which students are eligible to use these non-standard Student Test Booklets, please refer to the MCAS documents, *Requirements for the Participation of Students with Disabilities (Spring 2000 Update)* and *Requirements for the Participation of Students with Limited English Proficiency (Spring 2000 Update)*. Both publications are available on the Department's website at **www.doe.mass.edu/mcas**. Updates to these documents as they relate to the MCAS 2001 administration are expected in the winter semester of the 2000-2001 school year.

[4] For further information on the purpose and use of matrix-sampled items, please refer to the MCAS documents, *Release of Spring 2000 Test Items* and *Guide to Interpreting the Spring 2000 MCAS Reports for Schools and Districts.*

Grades and Content Areas Tested in Spring 2001

Table 1. MCAS 2001 Tests

Grade Tested	Content Area Tested				
	English Language Arts		Mathematics	Science and Technology/Engineering	History and Social Science
	Composition (Writing)	Language and Literature (Reading)			
3		X			
4	X	X	X		
5				X	X
6			X		
7	X	X			
8	X*	X*	X	X	X
9				(see note)	
10	X	X	X	(see note)	X

* This will be the final administration of the grade 8 English Language Arts test (both components).

NOTE: The one grade 10 MCAS Science & Technology test administered in previous years will be replaced in the future by six content-specific tests to be taken by students in grades 9 and 10. Separate tests will be given in the five areas of biology, chemistry, physics (introductory), earth science, and technology/engineering, and an integrated science test will be given that includes biology, chemistry, physics, and earth science. Question Tryouts in these content areas will take place in the spring of 2001. Please see chapter V, section G of this document for further information.

Reporting of MCAS Test Results

MCAS test results are reported through scaled scores and performance levels for individual students, schools, and districts.

Table 2. MCAS Performance Levels

MCAS Performance Level	General Description	Scaled Score Range
Advanced	Students at this level demonstrate • a comprehensive and in-depth understanding of rigorous subject matter • the ability to provide sophisticated solutions to complex problems	260-280
Proficient	Students at this level demonstrate • a solid understanding of challenging subject matter • the ability to solve a wide variety of problems	240-259
Needs Improvement	Students at this level demonstrate • partial understanding of subject matter • the ability to solve some simple problems	220-239
Failing	Students at this level demonstrate • minimal understanding of subject matter • an inability to solve simple problems	200-219

For additional information about scaled scores and performance levels, please refer to the MCAS publication, *Guide to Interpreting the Spring 2000 MCAS Reports for Schools and Districts,* available on the Department's website at **www.doe.mass.edu/mcas**.

The following reports of MCAS test results are among those issued in the fall following each year's MCAS administration:

- *Parent/Guardian Reports* (each report contains confidential student data)
- *School Report*
- *Test Item Analysis Report* (this report contains confidential student data)
- *District Report*
- *Summary of District Performance*
- *State Report of Results*
- *Technical Report*

Parent/Guardian Reports and *Test Item Analysis Reports* contain confidential student data that are not released to the public.

Please see the Department's website at **www.doe.mass.edu/mcas** for further information about all of these annual reports.

Table 3 below shows how results for each 2001 MCAS test will be reported.

Table 3. MCAS Results Reported in 2001

MCAS Test	Results Reported in 2001
Grade 3 Reading	**Fully reported:** student, school, and district scaled scores and performance levels NOTE: Results will be based ONLY on multiple-choice items.
Grade 4 ELA	**Fully reported:** student, school, and district scaled scores and performance levels
Mathematics	**Fully reported:** student, school, and district scaled scores and performance levels
Grade 5 Science and Technology/Engineering	Only ***Test Item Analysis Reports*** provided to schools; no scaled scores or performance levels
History and Social Science	Only ***Test Item Analysis Reports*** provided to schools; no scaled scores or performance levels
Grade 6 Mathematics	**Fully reported:** student, school, and district scaled scores and performance levels
Grade 7 ELA	**Fully reported:** student, school, and district scaled scores and performance levels
Grade 8 ELA	**Fully reported:** student, school, and district scaled scores and performance levels
Mathematics	**Fully reported:** student, school, and district scaled scores and performance levels
Science and Technology/Engineering	Only ***Test Item Analysis Reports*** provided to schools; no scaled scores or performance levels
History and Social Science	**Fully reported:** student, school, and district scaled scores and performance levels
Grade 9 Science and Technology/Engineering Question Tryouts	**No results** generated or reported
Grade 10 ELA	**Fully reported:** student, school, and district scaled scores and performance levels
Mathematics	**Fully reported:** student, school, and district scaled scores and performance levels
Science and Technology/Engineering Question Tryouts	**No results** generated or reported
History and Social Science	Only ***Test Item Analysis Reports*** provided to schools; no scaled scores or performance levels

C. *What's New for MCAS 2001?*

High School Competency Determination

MCAS 2001 test results will be the first MCAS results used to determine student eligibility for a high school diploma. Students who are members of the graduating class of 2003 are required to pass *both* the grade 10 MCAS **English Language Arts** *and* the grade 10 MCAS **Mathematics** tests as one condition for receiving a high school diploma (students must also meet all local graduation requirements). A scaled score of 220 (the lowest score in the *Needs Improvement* performance level) or higher will be considered a passing score on each test. Students who fail either or both tests will be given multiple opportunities before the end of their senior year to retake the test(s) they did not pass. See the Department's website (**www.doe.mass.edu/mcas**) or call 1-800-737-5103 for more information.

New Policy on Approved Bilingual Dictionary Use for Students with Limited English Proficiency

The Department of Education, in its continuing effort to provide maximum access to the MCAS tests for all students, has approved a new test accommodation for limited English proficient (LEP) students. Beginning with the MCAS 2001 administration, any student who is or has been an LEP student may use an approved bilingual (word-to-word) dictionary or electronic translator during MCAS testing. Approved bilingual dictionaries and electronic translators are limited to those that provide word-to-word translations, **without** definitions.

A list of approved bilingual dictionaries, including dictionary references for 55 languages spoken in Massachusetts schools, appears in the June 2000 Department publication, *Approved Bilingual Dictionaries for Use on the MCAS by Students with Limited English Proficiency.* This publication is posted on the Department of Education website at **www.doe.mass.edu/mcas**.

III. MCAS 2001
English Language Arts Tests

III. MCAS 2001
English Language Arts Tests

The MCAS 2001 English Language Arts (ELA) tests are based on the 1997 *English Language Arts Curriculum Framework.*[5]

A. MCAS English Language Arts Guide *Update*

The following information updates and supersedes that given in the MCAS publication, *Guide to the Massachusetts Comprehensive Assessment System: English Language Arts* (1998).

ELA Composition Test

- The MCAS English Language Arts Composition test (grades 4, 7, 8, and 10) no longer includes a "Short Session" (short composition).
- The scoring area for ELA Compositions labeled "Focus and Development" in the *Guide* is now referred to as "Topic Development."
- A separate ELA Composition Make-Up Test is issued and administered at each grade level (grades 4, 7, 8, and 10). Each grade's Make-Up Test uses a different writing prompt than the one appearing on the regularly scheduled ELA Composition test for that grade. Both writing prompts are considered common items.

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[5] A draft of a second edition of the *English Language Arts Curriculum Framework,* which incorporates minor refinements to and clarifications of the learning standards, was submitted to the Massachusetts Board of Education for review in June 2000. The public comment period on this document ended October 2, 2000; the Board accepted this draft in November 2000. Beginning with the 2002 MCAS administration, MCAS ELA tests will be based on the learning standards as presented in this 2000 *Framework.*

Reporting Categories

Individual students receive one MCAS English Language Arts score/performance level.

For grade 3, this ELA score/performance level is generated from the results of the Grade 3 Reading Test. In 2001, results for this test will be based on multiple-choice items only.

For grades 4, 7, 8, and 10, a student's results from both the ELA Composition and the ELA Language and Literature tests are combined to generate one overall English Language Arts score for that student. These students also receive comments from scorers about their ELA Compositions.

School and district MCAS English Language Arts results are reported under the following MCAS reporting categories:

- Language
- Literature
- Composition *(not applicable to the Grade 3 Reading Test)*
  - Topic Development
  - Use of Standard English Conventions

B. What's New for ELA 2001?

MCAS Grade 3 Reading Test

In response to the Commonwealth's increasing emphasis on early literacy, an MCAS Grade 3 Reading Test will be administered for the first time in April 2001. The 2001 test is similar in structure to the grade 4 MCAS ELA Language and Literature test; it is based exclusively on learning standards 4 through 17 of the 1997 Massachusetts *English Language Arts Curriculum Framework*'s Language and Literature strands.

MCAS Grade 7 English Language Arts Test

In order to provide middle schools with time to target English language arts instruction for students before they advance to high school, the MCAS grade 8 ELA test is being moved to grade 7. The MCAS 2001 administration will include MCAS English Language Arts tests for **both** grades 7 and 8; 2001 will mark the **final** administration of the grade 8 MCAS ELA test.

No Matrix-Sampled Items on the Grade 8 English Language Arts Test

Only **common** items will appear on the 2001 grade 8 MCAS English Language Arts test. No matrix-sampled items are included because the grade 8 English Language Arts test will be administered for the final time in 2001. Therefore, the 2001 test includes fewer items than have been included on previously administered grade 8 MCAS ELA tests.

Since MCAS student scores have always been based on common items only, comparisons of 2001 grade 8 ELA student scores with past years' results are still valid. School and district Subject Area Subscore results for grade 8 ELA, however, will not be parallel to past years' reported results.

High School Competency Determination

MCAS 2001 test results will be the first MCAS results used to determine student eligibility for a high school diploma. Students who are members of the graduating class of 2003 are required to pass the grade 10 MCAS English Language Arts test (both components) in order to receive a high school diploma.[6] A scaled score of 220 (the lowest score in the *Needs Improvement* performance level) or higher in English Language Arts will be considered a passing score. Students who fail will be given multiple opportunities before the end of their senior year to retake the test. See the Department's website (**www.doe.mass.edu/mcas**) or call 1-800-737-5103 for more information.

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[6] Grade 10 students who are members of the graduating class of 2003 are also required to pass the grade 10 MCAS Mathematics test and meet all local graduation requirements in order to receive a high school diploma.

C. English Language Arts 2001 Test Administration Schedule

MCAS Grade 3 Reading Test

Statewide Testing Window: April 9-13, 2001

ELA Composition

Statewide Administration Date: April 11, 2001
Statewide Make-Up Test Administration Date: May 10, 2001

ELA Language and Literature

Grades 4, 7, and 8 Statewide Testing Window: May 14-25, 2001
Grade 10 Statewide Testing Window: May 15-16, 2001

D. Grade 3 MCAS Reading Test

Learning Standards Assessed

The MCAS Grade 3 Reading Test assesses learning standards 4 through 17 of the *Framework*'s Language and Literature strands; these learning standards are presented in Appendix B of this document.

Test Structure

Item Types

The MCAS Grade 3 Reading Test, which is similar in design to the grade 4 ELA Language and Literature test, includes multiple-choice and open-response questions (items). Since this test includes no Composition strand component, no writing prompt is included.

The approximate distribution of test items on each test form by type is shown in Table ELA1 below. The table also shows how items are distributed between the common and matrix-sampled portions of the test.

Table ELA1. MCAS 2001 Grade 3 Reading Test
Approximate Number of Test Items Per Form by Type

	Item Type		
	Multiple-Choice	**Open-Response**	**Total Items Per Test Form**
Common	40	2*	42
Matrix-Sampled	8	1	9
Total Per Form	**48**	**3**	**51**

* Scaled score and performance level results for students, schools, and districts will be based solely on multiple-choice items. Item-analysis results for open-response items will be returned to schools in the fall of 2001.

Framework *Strands*

The approximate distribution of common score points across the two *Framework* strands by item type is shown in Table ELA2 below.

Table ELA2. MCAS 2001 Grade 3 Reading Test
Approximate Percentage of Total COMMON ITEM Score Points by Strand

	Language Strand		**Literature Strand**		**Totals**	
	# of Points	**% of Total**	**# of Points**	**% of Total**	**# of Points**	**% of Total**
Multiple-Choice	7	18	33	82	**40**	**100**
Open-Response	0	0	0	0	**0**	**0**
Totals	**7**	**18**	**33**	**82**	**40**	**100**

Reading Passages

On the MCAS Grade 3 Reading Test, developmentally appropriate reading passages are followed by either a small set (3-4 multiple-choice and 1 open-response) or a large set (6-8 multiple-choice and 1 open-response) of related questions. Approximately 50% of the reading passages are by authors listed in Appendices A and B of the 1997 *Framework.* A range of literary and non-literary texts, such as those listed below, are used:

- short stories
- chapter books
- poetry
- plays
- myths, legends, fables
- biographies/autobiographies
- interviews
- letters
- diary entries
- newspaper articles
- instructions
- advertisements

Test Administration

The Grade 3 Reading Test will be administered in three test sessions:

- Session 1 recommended time = 60 minutes
- Session 2 recommended time = 45 minutes
- Session 3 recommended time = 45 minutes

These recommended times update information provided in the Commissioner's memorandum dated November 6, 2000.

Please note that students will record their answers directly in their test booklets rather than in a separate answer booklet, as is the case for all other MCAS tests.

Dictionaries are not allowed during the Grade 3 Reading Test, with the exception of word-to-word bilingual dictionaries used by LEP students.

Reporting of Results

Results reported in 2001 for the MCAS Grade 3 Reading test will be based exclusively on multiple-choice items.

Scores for open-response items will be returned to schools to assist in local evaluation of curriculum and instruction.

Reading Passage

Abby and Joey do an interesting experiment. Read the passage below. Use the information in the passage to answer the questions that follow.

The Experiment

by Mary Ann Jost

"Try not to make too much noise," Dad said as he headed toward his office. "I have a lot of work to do this afternoon. And don't make a mess," he added. "Grandma's coming, remember?"

Abby and her little brother Joey sat down in the middle of the kitchen floor to think of something to do.

"I have an idea," Abby said. "Let's be scientists. Scientists don't make noise."

"O.K.," Joey said. "What's a scientist?"

"Scientists mix stuff together to see what will happen," Abby explained. "It's called an experiment."

"Oh," Joey said.

"You get a bowl and some spoons. I'll get stuff out of the refrigerator," Abby said.

"All right," said Joey.

Abby got out bottles and jars and set them on the table next to Joey's bowl. She dumped a thick yellow blob of mustard into the bowl. Then she splashed in some ketchup.

"Stir it," Abby said. "Scientists always stir stuff."

Joey stirred. The experiment turned orange.

"Cool," Joey said.

"I'll add more stuff," Abby said. "Scientists always add more stuff."

She plopped in some grape juice. Joey stirred. Abby added soy sauce, cranberry juice, and mayonnaise. Joey stirred. The experiment turned a color they had never seen before.

"Is everything all right out there?" Dad called from his office.

"Everything's fine," Abby called back. "Now, let's taste it," she told Joey. "Scientists always taste stuff. If it's food," she remembered to add.

They tasted the experiment. It tasted like something they had never tasted before.

"Needs more stuff," Abby said. She added a dash of hot-pepper sauce and some pickle juice. They tasted it again. It made their tongues tingle.

"Much better," said Abby.

Dad came into the kitchen. "It's so quiet in here. What—!" He stopped short and stared.

Abby and Joey looked where Dad was looking. They saw the messy bottles and jars without lids on the table. They saw the blobs of mustard and spots of soy sauce on the chairs. They saw the glob of ketchup on the ceiling.

Abby frowned and thought for a moment. Then she announced, "Time to clean up, Joey. Scientists always clean stuff up."

She got out the mop and a bucket of water and some soap. She and Joey and Dad put away the jars. They mopped and scrubbed and wiped and shined until everything was spick-and-span. As they worked, they talked about what Abby and Joey had put into the mixture. They talked about why the ketchup and mustard turned orange and why the hot-pepper sauce made their tongues tingle. And they talked about why they should only taste things they know are safe to eat. They were just putting away the mop when Mom dashed in the kitchen door with a bag of groceries in each arm.

"Looks great in here," she said, glancing around. "Now we have to get this chicken barbecued before Grandma gets here."

She spotted the bowl of "experiment" still sitting on the table. "Good," she said, "you already made the barbecue sauce."

"But—," Abby began.

"Try it," Dad said, winking at Abby.

"H'm," Mom said as she lifted a spoonful of the mixture to her lips. "Not bad. Kind of unusual, though. Where did you get the recipe?"

"It was an experiment," Abby explained.

"An original recipe," Dad added.

"Well, never mind," Mom said. "Grandma likes new things. By the way, you two," she added, "I saw that wink."

Grade 3 Reading Sample Items

Multiple-Choice Questions

1. Which statement BEST describes Abby?

   A. She enjoys cooking.

   ✓ B. She likes to try different things.

   C. She likes chicken.

   D. She enjoys working with Dad.

*Reporting Category/*Learning Standard for Item 1: ***Literature/*Learning Standard 12**

2. Why does Dad want Abby and Joey to be quiet?

   ✓ A. He has to work.

   B. He wants to rest in his office.

   C. He does not feel well.

   D. He wants to talk to Grandma.

*Reporting Category/*Learning Standard for Item 2: ***Literature/*Learning Standard 9**

3. The FIRST thing the children do after Dad goes into his office is

   A. get out the bowl and spoons.

   B. look in the refrigerator.

   ✓ C. think about what to do.

   D. talk about what scientists do.

*Reporting Category/*Learning Standard for Item 3: ***Literature/*Learning Standard 9**

Grade 3 Reading Sample Items

She plopped in some grape juice.

4. In this sentence, which word is a VERB?

A. She

✓ B. plopped

C. some

D. juice

*Reporting Category/*Learning Standard for Item 4: ***Language/*****Learning Standard 5**

"An original recipe," Dad added.

5. In this sentence, the word ***original*** means

A. sweet.

✓ B. new.

C. spicy.

D. messy.

*Reporting Category/*Learning Standard for Item 5: ***Literature/*****Learning Standard 8**

6. Why did Dad probably help the children clean up?

   A. He did not think the children knew how to do it.

   ✓ B. He wanted the kitchen clean before Grandma arrived.

   C. He wanted to make a barbecue sauce for Mom.

   D. He did not think the children would do it on their own.

*Reporting Category/*Learning Standard for Item 6: ***Literature/*Learning Standard 12**

7. When Mom says, "I saw that wink," it means Mom knows that

   A. Joey helped cook dinner.

   B. Dad was in his office.

   C. Grandma is coming to dinner.

   ✓ D. Abby and Dad have a secret.

*Reporting Category/*Learning Standard for Item 7: ***Literature/*Learning Standard 12**

Open-Response Question

8. What made the barbecue sauce original? Explain your answer using details from the story.

Reporting Category/Learning Standard for Item 8: ***Literature*/Learning Standard 12**

Reading Passage

What does the poet wonder about at nighttime? Read the poem below. Use the information in the poem to answer the questions that follow.

At Nighttime

At nighttime
when it's light time,
and the snow turns blue,
and maple trees are empty
Stanza 1 as the moon shows through,
and every star is shiny
as a silver spike,
I wonder
what the Weather
up in space
is like.

I wonder . . .
is there skating
Stanza 2 on the far-off stars?
And snowy hills
for sliding
on a planet such as Mars?

I wonder how the mountains
Stanza 3 of the moon must be
for skiers who are learning
how to ski . . . like me.

Some day
I'll take a rocket
Stanza 4 (raisins in my pocket),
and zip away with Skipper
to the moon . . . and *see.*

—Aileen Fisher

Multiple-Choice Questions

9. In line 2, what does "when it's light time" mean?

A. when the street lights are bright

B. when the sun is shining

✔ C. when the moon and stars are bright

D. when the snow is shining bright

*Reporting Category/*Learning Standard for Item 9: ***Literature*/Learning Standard 15**

10. The poet does her wondering in the

A. summer.

B. fall.

✔ C. winter.

D. spring.

*Reporting Category/*Learning Standard for Item 10: ***Literature*/Learning Standard 9**

Grade 3 Reading Sample Items

11. In line 17, the word *Mars* begins with a CAPITAL LETTER because it is

A. a verb.

B. a pronoun.

C. an adjective.

✓ D. a proper noun.

*Reporting Category/*Learning Standard for Item 11: ***Language/*Learning Standard 5**

... and zip away with Skipper ...

12. In this phrase, what does the word *zip* mean?

A. click

B. walk slowly

✓ C. move quickly

D. ski

*Reporting Category/*Learning Standard for Item 12: ***Literature/*Learning Standard 8**

Open-Response Question

13. What does the poet wonder about at nighttime? Explain your answer using THREE examples from the poem.

*Reporting Category/*Learning Standard for Item 13: ***Literature/*Learning Standard 9**

E. Grade 4 MCAS English Language Arts Test

Test Structure

Item Types

The MCAS Grade 4 English Language Arts test is presented in two parts:

- the ELA Composition test, which assesses learning standards from the *Framework*'s **Composition** strand through a writing prompt

- the ELA Language and Literature test, which assesses learning standards 4 through 17 of the *Framework*'s **Language** and **Literature** strands, and includes **multiple-choice** and open-response questions (items)

These two tests are further described below. The *Framework* learning standards they assess are presented in Appendix B of this document.

The approximate distribution of items by type on each test is shown in Table ELA3 below. The table also shows how items are distributed between the common and matrix-sampled portions of the test.

Table ELA3. MCAS 2001 Grade 4 English Language Arts Test
Approximate Number of Test Items by Type

	Item Type			
	Writing Prompt	**Multiple-Choice**	**Open-Response**	**Total Items**
Common	1	36	4	41
Matrix-Sampled	0	12	2	14
Total Per Form	**1**	**48**	**6**	**55**

Framework *Strands*

The approximate distribution of common score points across the three *Framework* strands is shown in Table ELA4 below.

Table ELA4. MCAS 2001 Grade 4 English Language Arts Test Approximate Percentage of Total COMMON ITEM Score Points by Strand

	Language Strand		Literature Strand		Composition Strand		Totals	
	# of Points	% of Total	# of Points	% of Total	# of Points	% of Total	# of Points	% of Total
Multiple-Choice	6	8	30	42	—	—	**36**	**50**
Open-Response	—	—	16	22	—	—	**16**	**22**
Writing Prompt	—	—	—	—	20	28	**20**	**28**
Totals	**6**	**8**	**46**	**64**	**20**	**28**	**72**	**100**

Grade 4 ELA Composition

The Composition portion of the grade 4 MCAS English Language Arts test assesses students' skill at writing in a narrative mode that chronicles and/or describes a particular event or experience. The test is structured to include some of the key elements of the writing process: drafting, revising, and finalizing.

The ELA Composition test includes **two** test sessions (recommended time: 45 minutes per session) administered on the same day, with a short break between the sessions. In the first test session, students respond to a writing prompt by preparing a first draft of their writing. Following the break, students return to revise this first draft into a second draft, which is submitted for scoring.

Students are allowed access to an English-language dictionary (a minimum of one per classroom) during ELA Composition test sessions.

Grade 4 ELA Language and Literature

The grade 4 MCAS ELA Language and Literature test is administered in **three** test sessions (recommended time: 60 minutes per session).

All test items on the Language and Literature component of the grade 4 MCAS English Language Arts test are linked to developmentally appropriate reading passages, approximately 50% of which are by authors listed in Appendices A and B of the 1997 *Framework*. Both literary (approximately 60%) and non-literary (approximately 40%) passage types appear on the grade 4 ELA Language and Literature test.

Passages are followed by either a small item set (3-4 multiple-choice and 1 open-response) or a large item set (6-8 multiple-choice and 1 open-response).

No reference materials are allowed during ELA Language and Literature test sessions, with the exception of bilingual word-to-word dictionaries used by LEP students.

Sample Items

For samples of items that appear on the grade 4 MCAS ELA Composition and ELA Language and Literature tests, see the MCAS documents, *Guide to the Massachusetts Comprehensive Assessment System: English Language Arts* (1998)[7] and *Release of Test Items* (1998, 1999, 2000). These documents are available on the Department's website at www.doe.mass.edu/mcas.

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[7] Please note the brief update to this *Guide* provided in section A of this chapter.

F. Grade 7 MCAS English Language Arts Test

Test Structure

Item Types

The MCAS Grade 7 English Language Arts test, which is similar in design to the grade 8 English Language Arts test, is presented in two parts:

- the ELA Composition test, which assesses learning standards from the *Framework*'s Composition strand through a writing prompt
- the ELA Language and Literature test, which assesses learning standards 4 through 17 of the *Framework*'s Language and Literature strands, and includes multiple-choice and open-response questions (items)

These two tests are further described below. The *Framework* learning standards they assess are presented in Appendix B of this document.

The approximate distribution of items by type on each test is shown in Table ELA5 below. The table also shows how items are distributed between the common and matrix-sampled portions of the test.

Table ELA5. MCAS 2001 Grade 7 English Language Arts Test
Approximate Number of Test Items by Type

	Item Type			
	Writing Prompt	**Multiple-Choice**	**Open-Response**	**Total Items**
Common	1	36	4	**41**
Matrix-Sampled	0	12	2	**14**
Total Per Form	**1**	**48**	**6**	**55**

Framework *Strands*

The approximate distribution of common score points across the three *Framework* strands is shown in Table ELA6 below.

Table ELA6. MCAS 2001 Grade 7 English Language Arts Test
Approximate Percentage of Total COMMON ITEM Score Points by Strand

	Language Strand		Literature Strand		Composition Strand		Totals	
	# of Points	% of Total	# of Points	% of Total	# of Points	% of Total	# of Points	% of Total
Multiple-Choice	6	8	30	42	—	—	**36**	**50**
Open-Response	—	—	16	22	—	—	**16**	**22**
Writing Prompt	—	—	—	—	20	28	**20**	**28**
Totals	**6**	**8**	**46**	**64**	**20**	**28**	**72**	**100**

Grade 7 ELA Composition

The Composition portion of the grade 7 MCAS English Language Arts test assesses students' skill at writing in an **informative** mode that shares knowledge and conveys messages, instructions, and ideas. The test is structured to include some of the key elements of the writing process: drafting, revising, and finalizing.

The ELA Composition test includes **two test sessions** (recommended time: 45 minutes per session) administered on the same day, with a short break between the sessions. In the first test session, students respond to a writing prompt by preparing a first draft of their writing. Following the break, students return to revise this first draft into a second draft, which is submitted for scoring.

Students are allowed access to an English-language dictionary (a minimum of one per classroom) during ELA Composition test sessions.

Grade 7 ELA Composition Sample Item

Writing Prompt

Adults at school can have a positive effect on your life. An adult may have said or done something special or helped you in some important way.

Choose a favorite adult at your elementary or middle school. Describe the qualities that make this person special to you.

*Reporting Category/*Learning Standard: ***Composition/*****Learning Standards 19-22**

Grade 7 ELA Language and Literature

The grade 7 MCAS ELA Language and Literature test is administered in three test sessions (recommended time: 45 minutes per session).

On the MCAS Grade 7 Reading Test, developmentally appropriate reading passages are followed by either a small set (3-4 multiple-choice and 1 open-response) or a large set (6-8 multiple-choice and 1 open-response) of related questions. Approximately 50% of the reading passages are by authors listed in Appendices A and B of the 1997 *Framework*. A range of literary and non-literary texts, such as those listed below, are used:

- short stories
- novel excerpts
- poetry
- plays
- myths, legends, fables, etc.
- biographies/autobiographies
- essays
- speeches
- editorials
- interviews
- letters
- diary entries
- newspaper articles
- reviews
- instructions
- advertisements

No reference materials are allowed during ELA Language and Literature test sessions, with the exception of bilingual word-to-word dictionaries used by LEP students.

Reading Passage

The possibility that a huge monster exists in Scotland's Loch Ness has intrigued people from all walks of life for many years. This article talks about people who have claimed to have seen "Nessie" and what steps have been taken to search for her. Read the article below. Use the information in the article to answer the questions that follow.

The Quest for Nessie

Reprinted with permission from *MYSTERIES OF THE UNKNOWN: Mysterious Creatures* by the Editors of Time-Life Books © 1988 Time Life Inc.

Nestled deep in the Scottish Highlands, surrounded by rugged mountains and forests and fields, Loch Ness is one of Europe's great lakes. Its length is a modest twenty-four miles, and its width rarely exceeds one mile; but the fantastic depth—more than 700 feet in places—makes Loch Ness by volume the third-largest body of fresh water in Europe. And it is by all odds the most mysterious. In those frigid waters, rendered dark and virtually opaque by peat leached from the land, a huge creature is said to reside.

Among the countless believers is Hugh Ayton, a farmer who in 1963 was tilling land that bordered the lake near the village of Dores. Ayton, his son Jim, and three other men were still working at 7:30 one serene August evening when the son saw something moving across the lake. The men stared where the youth was excitedly pointing. "It was big and black," said Ayton later. "The loch was calm and everything was quiet; there wasn't a noise anywhere. Just this thing moving steadily forward."

Suddenly, the men realized that they were watching "the monster" of Loch Ness lore, and in an instant, curiosity overwhelmed caution. Racing down to a nearby jetty, four of them jumped into a small rowboat equipped with an outboard motor and took off after it. "The thing was still coming down the loch," recalled Ayton, "and as we got closer, we could see more details of it. There was a long neck coming about six feet out of the water, and a head which reminded me rather of a horse, though bigger and flatter. The body was made up of three low humps—about 30 to 40 feet long in all and about four feet high. The color was dark and the skin looked rough."

The men were within about fifty yards of the creature, related Ayton, when it "rose up a little out of the water and dived and put up an enormous disturbance which swirled the boat around." A few seconds later, the head resurfaced, then it disappeared for good. "The one feature of it that I'll always remember," said Ayton, "was the eye—an oval-shaped eye near the top of its head. I'll always remember that eye looking at us."

History does not record when the first of the lake creatures was sighted or who encountered it. Water spirits and other such beings have been a part of Highland legend for many centuries. . .

One of the first of the modern-day sightings is said to have occurred in 1880, when a seasoned Loch Ness waterman named Duncan McDonald was examining a boat that had sunk in the lake. McDonald was examining the wreck when he signaled frantically to be pulled to the surface. Ashen faced, trembling uncontrollably, and incoherent with fear, he was finally able to blurt out that he had seen a monster in the murky water. He had gotten a good look at one of the creature's eyes, he reported, and described it as "small, gray and baleful." According to some accounts, McDonald never entered the lake again.

Since then, there have been something like 3,000 reported sightings—from shore and from boats, in every daylight hour, some vague and some powerfully detailed—by every imaginable sort of person, singly and in groups of a score or more: farmers and priests, fishermen and lawyers, policemen and politicians, and even a Nobel prize-winning chemist, the Englishman Richard L. M. Synge, who saw the creature in 1938. Million-dollar expeditions have descended on Loch Ness. Investigators have spent months at a time scanning the lake with binoculars, have launched minisubmarines into its depths, and have probed its gloomy reaches with strobe-light cameras and sonar equipment. One investigator estimated that for every observation, there have been 350 hours of concerted search, leading to scores of books, some scornfully debunking, others stoutly championing "Nessie" as she—for some reason, the monster seems to have been deemed female—has come to be called.

Nevertheless, the lake has yet to yield an ancient bone, a bit of tissue, or any other definitive testimony to the monster's presence. Aside from the volumes of eyewitness reports, the evidence consists of only a handful of fuzzy and ambiguous photographs and films and some debatable sonar readings. For all the ardent attention, the puzzles of Loch Ness and its elusive creature are no closer to solution now than they were that day in 1880 when Duncan McDonald was scared half to death by the ominous form he supposedly spotted in the dim, peat-stained waters.

Multiple-Choice Questions

1. The first paragraph makes the point that Loch Ness is distinctive as a lake because it is

✓ A. exceptionally deep.

B. unusually wide.

C. surrounded by mountains.

D. filled with seaweed.

*Reporting Category/*Learning Standard for Item 1: ***Literature/*Learning Standard 9**

2. Which of the following questions can be answered using information from the passage?

A. How many of the reported sightings of Nessie are believable?

B. Why was a Nobel prize-winning scientist looking for Nessie?

✓ C. What kinds of people have reported seeing Nessie?

D. How many films and photographs of Nessie exist?

*Reporting Category/*Learning Standard for Item 2: ***Literature/*Learning Standard 13**

3. What do Hugh Ayton's and Duncan McDonald's accounts of Nessie have in common?

✓ A. Both men remembered the creature's eyes.

B. Both men refused to enter the lake again.

C. Both men judged the creature to be 30 to 40 feet long.

D. Both men were terribly frightened by their encounter with "the monster."

*Reporting Category/*Learning Standard for Item 3: ***Literature/*Learning Standard 13**

4. "History does not record when the first of the lake creatures was sighted or who encountered it." What part of speech is *record* in the sentence above?

A. adjective

B. adverb

C. noun

✓ D. verb

*Reporting Category/*Learning Standard for Item 4: ***Language/*Learning Standard 6**

Open-Response Question

5. Why has there been such disagreement over the possible existence of Nessie? Use information from the article to explain **both** sides of the controversy.

*Reporting Category/*Learning Standard for Item 5: ***Literature/*****Learning Standard 13**

Reading Passage

[Due to copyright restrictions, this reading passage will not appear in the Internet version of this document.]

The poem "Dusting" is much more than the description of a simple daily chore. Read the poem. Use the information in the poem to answer the questions that follow.

Dusting

Each morning I wrote my name
on the dusty cabinet, then crossed
the dining table in script, scrawled
in capitals on the backs of chairs,
practising signatures like scales
while Mother followed, squirting
linseed from a burping can
into a crumpled-up flannel.

She erased my fingerprints
from the bookshelf and rocker,
polished mirrors on the desk
scribbled with alphabets.
My name was swallowed in the towel
with which she jeweled the table tops.
The grain surfaced in the oak
and the pine grew luminous.
But I refused with every mark
to be like her, anonymous.

—Julia Alvarez

Multiple-Choice Questions

6. When the child says the mother "jeweled the table tops" the child means that the mother

✔ A. polished the table tops until they shone.

B. dripped linseed oil on the table tops in tiny shining drops.

C. prized the valuable table top.

D. laid her jewelry on the table.

*Reporting Category/*Learning Standard for Item 6: ***Literature/*Learning Standard 15**

7. In line 2, the word *dusty* is what part of speech?

A. verb

B. adverb

C. noun

✔ D. adjective

*Reporting Category/*Learning Standard for Item 7: ***Language/*Learning Standard 5**

8. Which word best describes the child in this poem?

A. sloppy

✔ B. determined

C. disobedient

D. satisfied

*Reporting Category/*Learning Standard for Item 8: ***Literature/*Learning Standard 9**

Open-Response Question

9. What does the job of dusting symbolize to the child in this poem? Use specific details from the poem to support your answer.

*Reporting Category/*Learning Standard for Item 9: ***Literature/*****Learning Standard 15**

G. Grade 8 MCAS English Language Arts Test

Test Structure

The grade 8 MCAS English Language Arts test will be administered for the final time in the MCAS 2001 administration. It serves as a bridge to provide students who are in grade 8 during the 2000-2001 school year with an MCAS ELA score prior to taking the high-stakes grade 10 English Language Arts test.

Only **common** items will appear on the 2001 grade 8 MCAS English Language Arts test. No matrix-sampled items are included because the grade 8 English Language Arts test will be administered for the final time in the MCAS 2001 administration, and no further test development is necessary. Therefore, the 2001 test includes fewer items than previously administered grade 8 MCAS ELA tests have included. Since MCAS student scores have always been based on common items only, comparisons of 2001 grade 8 ELA student scores with past years' results are still valid. However, school and district Subject Area Subscore results for 2001 grade 8 English Language Arts will **not** be parallel to past years' reported results.

Item Types

The 2001 grade 8 English Language Arts test is presented in two parts:

- the ELA Composition test, which assesses learning standards from the *Framework*'s **Composition** strand through a **writing prompt**
- the ELA Language and Literature test, which assesses learning standards 4 through 17 of the *Framework*'s **Language** and **Literature** strands, and includes **multiple-choice** and **open-response** questions (items)

These two tests are further described below. The *Framework* learning standards they assess are presented in Appendix B of this document.

The approximate distribution of items by type on each test is shown in Table ELA7 below.

Table ELA7. MCAS 2001 Grade 8 English Language Arts Test
Approximate Number of Test Items by Type

Writing Prompt	Multiple-Choice	Open-Response
1	36	4

Framework *Strands*

The approximate distribution of score points across the three *Framework* strands is shown in Table ELA8 below.

Table ELA8. MCAS 2001 Grade 8 English Language Arts Test Approximate Percentage of Total COMMON ITEM Score Points by Strand

	Language Strand		Literature Strand		Composition Strand		Totals	
	# of Points	% of Total	# of Points	% of Total	# of Points	% of Total	# of Points	% of Total
Multiple-Choice	5	7	31	43	—	—	**36**	**50**
Open-Response	—	—	16	22	—	—	**16**	**22**
Writing Prompt	—	—	—	—	20	28	**20**	**28**
Totals	**5**	**7**	**47**	**65**	**20**	**28**	**72**	**100**

Grade 8 ELA Composition

The Composition portion of the grade 8 MCAS English Language Arts test assesses students' skill at writing in a persuasive mode that takes a stand on an issue and convinces the reader to take the same stand. The test is structured to include some of the key elements of the writing process: drafting, revising, and finalizing.

The ELA Composition test includes **two test sessions** (recommended time: 45 minutes per session) administered on the same day, with a short break between the sessions. In the first test session, students respond to a writing prompt by preparing a first draft of their writing. Following the break, students return to revise this first draft into a second draft, which is submitted for scoring.

Students are allowed access to an English-language dictionary (a minimum of one per classroom) during ELA Composition test sessions.

Grade 8 ELA Language and Literature

The 2001 grade 8 MCAS ELA Language and Literature test is administered in **two test sessions** (recommended time: 45 minutes per session).

All test items on the Language and Literature component of the grade 8 MCAS English Language Arts test are linked to developmentally appropriate reading passages, approximately 50% of which are by authors listed in Appendices A and B of the 1997 *Framework*. Both literary (approximately 60%) and non-literary (approximately 40%) passage types appear on the grade 8 ELA Language and Literature test.

Passages are followed by either a small item set (3-4 multiple-choice and 1 open-response) or a large item set (6-8 multiple-choice and 1 open-response).

No reference materials are allowed during ELA Language and Literature test sessions, with the exception of bilingual word-to-word dictionaries used by LEP students.

Sample Items

For samples of items that appear on the grade 8 MCAS ELA Composition and ELA Language and Literature tests, see the MCAS documents, *Guide to the Massachusetts Comprehensive Assessment System: English Language Arts* (1998)[8] and *Release of Test Items* (1998, 1999, 2000). These documents are available on the Department's website at www.doe.mass.edu/mcas.

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[8] Please note the brief update to this *Guide* provided in section A of this chapter.

H. Grade 10 MCAS English Language Arts Test

Test Structure

Item Types

The MCAS Grade 10 English Language Arts test is presented in two parts:

- the ELA Composition test, which assesses learning standards from the *Framework*'s **Composition** strand through a **writing prompt**
- the ELA Language and Literature test, which assesses learning standards 4 through 17 of the *Framework*'s **Language** and **Literature** strands, and includes **multiple-choice** and **open-response** questions (items)

These two tests are further described below. The *Framework* learning standards they assess are presented in Appendix B of this document.

The approximate distribution of items by type on each test is shown in Table ELA9 below. The table also shows how items are distributed between the common and matrix-sampled portions of the test.

Table ELA9. MCAS 2001 Grade 10 English Language Arts Test
Approximate Number of Test Items by Type

	Item Type			
	Writing Prompt	**Multiple-Choice**	**Open-Response**	**Total Items**
Common	1	36	4	**41**
Matrix-Sampled	0	12	2	**14**
Total Per Form	**1**	**48**	**6**	**55**

Framework *Strands*

The approximate distribution of common score points across the three *Framework* strands is shown in Table ELA10 below.

Table ELA10. MCAS 2001 Grade 10 English Language Arts Test Approximate Percentage of Total COMMON ITEM Score Points by Strand

	Language Strand		Literature Strand		Composition Strand		Totals	
	# of Points	% of Total	# of Points	% of Total	# of Points	% of Total	# of Points	% of Total
Multiple-Choice	6	8	30	42	—	—	**36**	**50**
Open-Response	—	—	16	22	—	—	**16**	**22**
Writing Prompt	—	—	—	—	20	28	**20**	**28**
Totals	**6**	**8**	**46**	**64**	**20**	**28**	**72**	**100**

Grade 10 ELA Composition

The Composition portion of the grade 10 MCAS English Language Arts test assesses students' skill at literary analysis, using their knowledge of literary elements, themes, and structures to analyze an excerpt from a literary text. The test is structured to include some of the key elements of the writing process: drafting, revising, and finalizing.

The ELA Composition test includes two test sessions (recommended time: 45 minutes per session) administered on the same day, with a short break between the sessions. In the first test session, students respond to a writing prompt by preparing a first draft of their writing. Following the break, students return to revise this first draft into a second draft, which is submitted for scoring.

Students are allowed access to an English-language dictionary (a minimum of one per classroom) during ELA Composition test sessions.

Grade 10 ELA Language and Literature

The grade 10 MCAS ELA Language and Literature test will be administered in three test sessions (recommended time: 45 minutes per session) scheduled on May 15 (sessions 1 and 2) and May 16 (session 3), 2001.

All test items on the Language and Literature component of the grade 10 MCAS English Language Arts test are linked to developmentally appropriate reading passages, approximately 50% of which are by authors listed in Appendices A and B of the 1997 *Framework*. Both literary (approximately 60%) and non-literary (approximately 40%) passage types appear on the grade 10 ELA Language and Literature test.

Passages are followed by either a small item set (3-4 multiple-choice and 1 open-response) or a large item set (6-8 multiple-choice and 1 open-response).

No reference materials are allowed during ELA Language and Literature test sessions, with the exception of bilingual word-to-word dictionaries used by LEP students.

High School Competency Determination

MCAS 2001 test results will be the first MCAS results used to determine student eligibility for a high school diploma. Students who are members of the graduating class of 2003 are required to pass the grade 10 MCAS English Language Arts test (both components) in order to receive a high school diploma.[9] A scaled score of 220 (the lowest score in the *Needs Improvement* performance level) or higher in English Language Arts will be considered a passing score. Students who fail will be given multiple opportunities before the end of their senior year to retake the test. See the Department's website (**www.doe.mass.edu/mcas**) or call 1-800-737-5103 for more information.

Sample Items

For samples of items that appear on the grade 10 MCAS ELA Composition and ELA Language and Literature tests, see the MCAS documents, *Guide to the Massachusetts Comprehensive Assessment System: English Language Arts* (1998)[10] and *Release of Test Items* (1998, 1999, 2000). These documents are available on the Department's website at **www.doe.mass.edu/mcas.**

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[9] Grade 10 students who are members of the graduating class of 2003 are also required to pass the grade 10 MCAS Mathematics test and meet all local graduation requirements in order to receive a high school diploma.

[10] Please note the brief update to this *Guide* provided in section A of this chapter.

IV. MCAS 2001
Mathematics Tests

IV. MCAS 2001 Mathematics Tests

A. New 2000 Mathematics Curriculum Framework

The Massachusetts Board of Education adopted a revision of the *Mathematics Curriculum Framework* in July 2000. The final *Framework* was presented to the public in November 2000. This 2000 *Framework* replaces the 1996 *Framework* used as the basis for past MCAS tests. Revisions incorporated in the 2000 *Framework* will not affect results reported for the 2001 MCAS tests (see "Learning Standards Assessed in 2001" below). The 2000 document is available on the Department's website at www.doe.mass.edu/frameworks.

The 2000 *Framework* implements minor revisions to the 1996 *Framework* that are designed to clarify, strengthen, and provide more options for the organization and assessment of mathematics courses at the secondary level. One revision, for example, is the grouping of learning standards into narrower grade spans (preK-K, 1-2, 3-4, 5-6, 7-8, 9-10, and 11-12) in response to requests from schools for clarity and specificity in the standards. Another revision is the articulation of learning standards for year-long courses in Algebra I, Geometry, Algebra II, and Precalculus, in addition to integrated-course learning standards similar to those defined in the 1996 *Framework*.

The 2000 *Framework* renames and expands the mathematics strands from four to five, as follows:

- Number Sense and Operations
- Patterns, Relations, and Algebra
- Geometry
- Measurement
- Data Analysis, Statistics, and Probability

The 1996 "Geometry and Measurement" strand was separated into two strands in the new *Framework* to align with the format of the National Council of Teachers of Mathematics (NCTM) *Principles and Standards for School Mathematics*.

Learning Standards Assessed in 2001

The MCAS 2001 Mathematics tests are based on the 2000 *Mathematics Curriculum Framework*. **However, student, school, and district scores for 2001 will be based solely on learning standards COMMON to both the 1996 and the 2000 *Mathematics Curriculum Frameworks*.** Comparison of the 2001 student, school, and district MCAS mathematics scores with previous years' results will, therefore, still be valid.

Please refer to the grade-specific sections of this chapter for further information regarding which learning standards assessed in previous MCAS administrations will no longer be tested at that grade level because they were moved to a higher grade level in the 2000 *Framework*.

Although the 2001 MCAS tests will include matrix-sampled test items that are based on learning standards new to the 2000 *Framework*, such test items will not be used to determine student, school, or district scores in 2001. Learning standards new to the 2000 *Framework* are presented in Appendix E of this document.

B. *MCAS* Mathematics Guide *Update*

The following information updates and supersedes that given in the MCAS publication, *Guide to the Massachusetts Comprehensive Assessment System: Mathematics* (1998).

Framework Page Number References

Page numbers given for *Mathematics Curriculum Framework* references are no longer applicable because they reference the 1996 *Framework*.

Section No Longer Applicable

The grade 10 section of the *Guide*, **Patterns, Relations, and Functions: Trigonometry**, is no longer applicable; the 2000 *Framework* re-assigns these learning standards to grades 11 and 12.

Strands, Substrands, Assessment Expectations, and Sample Materials

The four **strand divisions** (e.g., Number Sense) used in the *Guide* still parallel the five strands identified in the 2000 *Framework*. However, most of the **substrand headings** (e.g., grade 4: Estimation, grade 8: Number Systems and Number Theory, grade 10: Mathematical Structure) listed in the *Guide* are no longer specifically applicable; most have been merged into larger categories in the 2000 *Framework* to enhance the stability of subscore results. Please refer to the 2000 *Framework* for new learning standard categories.

In the "Geometry and Measurement" sections of the *Guide*, at least one substrand at each grade level relates clearly to either the Geometry or the Measurement strand of the new *Framework*. Those substrands that are less clearly related are clarified below:

Grade 4: The substrand "Geometry and Spatial Sense" (pages 43-46 of the *Guide*) relates to the new *Framework*'s Geometry strand.

Grade 8: The substrand "Geometric Measurement" (pages 90-92 of the *Guide*) relates to the new *Framework*'s Measurement strand.

Grade 10: The substrand "Geometry and Spatial Sense" (pages 120-122 of the *Guide*) relates to the new *Framework*'s Geometry strand.

The substrand "Geometry from an Algebraic Perspective" (pages 126-128 of the *Guide*) relates to the new *Framework*'s Geometry strand.

Assessment expectations defined in the *Guide* do not cross-reference to the 2000 *Framework* learning standards.

Almost all of the sample questions and materials provided in the *Guide* are still relevant to the learning standards assessed on the 2001 MCAS Mathematics tests.

Tool Kits and Reference Sheets

The grade 4 Mathematics Tool Kit and the grades 8 and 10 Mathematics Reference Sheets provided in Appendix A of the *Guide* are provided as examples only. These materials are slightly modified each year to provide appropriate assistance based on specific test items.

A Grade 6 Mathematics Reference Sheet, containing formulas, and a Grade 6 Mathematics Tool Kit, containing a punch-out ruler and protractor, will be provided for student reference during test administration. Samples are provided in Appendix C of this document.

Calculator Use

Students in grades 8 and 10 are allowed to use calculators during two of the three MCAS Mathematics test sessions. All test items for the calculator sessions of the MCAS Mathematics tests are developed assuming use of a four-function calculator with a square root key. Although students are permitted to use more sophisticated calculators, those calculators offer no testing advantage over a four-function calculator with a square root key.

Calculator use is **not** allowed during administration of **any** grade 4 or grade 6 MCAS Mathematics test session.

Reporting and Reporting Categories

Individual students receive one MCAS Mathematics score/performance level.

The reporting categories listed in the *Guide* are no longer applicable. School and district MCAS Mathematics results will be reported in 2001 under the following reporting categories (which mirror the MCAS reporting categories for the 2000 test results):

- Number Sense and Operations
- Patterns, Relations, and Algebra
- Geometry and Measurement (this reporting category will be split into separate reporting categories after 2001 to parallel the strands of the new *Framework*)
- Data Analysis, Statistics, and Probability

C. What's New for Mathematics 2001?

MCAS Grade 6 Mathematics Test

In order to measure student performance in mathematics between the grades of 4 and 8, an MCAS Mathematics test has been added at grade 6.

The grade 6 MCAS Mathematics test was field-tested in 2000 and will be administered for the first time in 2001. Scaled score and performance level results for the 2001 test will be fully reported for students, schools, and districts.

High School Competency Determination

MCAS 2001 test results will be the first MCAS results used to determine student eligibility for a high school diploma. Students who are members of the graduating class of 2003 are required to pass the grade 10 MCAS Mathematics test in order to receive a high school diploma.[11] A scaled score of 220 (the lowest score in the *Needs Improvement* performance level) or higher in Mathematics will be considered a passing score. Students who fail will be given multiple opportunities before the end of their senior year to retake the test. See the Department's website (www.doe.mass.edu/mcas) or call 1-800-737-5103 for more information.

The grade 10 section of this chapter (section H) includes a special note about the 2000 *Framework*'s learning standards and the 2001 grade 10 test.

D. Mathematics
2001 Test Administration Schedule

Grades 4, 6, and 8 Statewide Testing Window:
May 14-25, 2001

Grade 10 Statewide Testing Window:
May 16-17, 2001

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[11] Grade 10 students who are members of the graduating class of 2003 are also required to pass the grade 10 MCAS English Language Arts test and meet all local graduation requirements in order to receive a high school diploma.

E. Grade 4 MCAS Mathematics Test

Learning Standards Assessed

The 2001 grade 4 MCAS Mathematics test is based solely on learning standards common to the pre-K-4 grade span of the 1996 *Framework* and either the 3-4 or an earlier grade span of the 2000 *Framework*.

Clarification: Number Sense and Operations Strand

Although learning standard 4.N.16 of the new *Framework* requires students to round numbers through 100,000, the 2001 test will only require students to round through 10,000.

Also, although most of learning standard 4.N.12 is intended to be assessed locally (see Appendix E), the 2001 test **will** test students on the multiplication of two digits by two digits.

Clarification: Geometry Strand

In the 2000 *Framework,* learning standard 4.G.6 has been limited to apply to the first quadrant only, as follows:

- using ordered pairs of numbers and/or letters, graph, locate, identify points, and describe paths (first quadrant).

Clarification: Data Analysis, Statistics, and Probability Strand

The 2001 test **will not** require grade 4 students to **create** circle graphs, e.g., pie charts, but it **will** present pie charts as graphs to be matched or read.

New Standards

Please see Appendix E of this document for a list of grade 4 learning standards that appear for the first time in the 2000 *Framework*. These learning standards will not be used to generate reported results in 2001.

Test Structure

Item Types

The grade 4 MCAS Mathematics test includes multiple-choice, short-answer, and open-response questions (items). The approximate distribution of items by type on each test form is shown in Table M1 below. The table also shows how items are distributed between the common and matrix-sampled portions of the test.

Table M1. MCAS 2001 Grade 4 Mathematics Test
Approximate Number of Test Items Per Form by Type

	Item Type							
	Multiple-Choice		Short-Answer		Open-Response		Total Items Per Test Form	
	# of Items	% of Total Score	# of Items	% of Total Score	# of Items	% of Total Score	# of Items	% of Total Score
Common	29	54	5	9	5	37	**39**	**100**
Matrix-Sampled	7	—	1	—	1	—	**9**	**—**
Total Per Form	**36**	**54**	**6**	**9**	**6**	**37**	**48**	**100**

Thinking Skills

The approximate distribution of common score points by mathematical thinking skill is shown in Table M2 below.

Table M2. MCAS 2001 Grade 4 Mathematics Test
Approximate Percentage of Total COMMON ITEM Score Points by Mathematical Thinking Skill

Thinking Skill	Score Points	Percent of Total Points
Procedural	22	41
Conceptual	22	41
Application/Problem-Solving	10	18
Totals	**54**	**100**

Framework *Strands*

The approximate distribution of common score points by *Framework* strand is shown in Table M3 below.

Table M3. MCAS 2001 Grade 4 Mathematics Test
Approximate Percentage of Total COMMON ITEM Score Points by *Framework* Strand

Framework Strand	Score Points	Percent of Total Points
Number Sense and Operations	19	35
Patterns, Relations, and Algebra	11	20
Geometry and Measurement	13	25
Data Analysis, Statistics, and Probability	11	20
Totals	**54**	**100**

Test Administration

The grade 4 MCAS Mathematics test will be administered in two test sessions (recommended time: 60 minutes per session).

Calculator use is not allowed during any grade 4 MCAS Mathematics test session.

A Mathematics Tool Kit containing punch-out manipulatives is provided with the test for student reference. Other than the grade 4 Mathematics Tool Kit, no reference materials are allowed during any grade 4 MCAS Mathematics test session (with the exception of bilingual word-to-word dictionaries used by LEP students).

Sample Items

For samples of items that appear on the grade 4 MCAS Mathematics test, see the MCAS documents, *Guide to the Massachusetts Comprehensive Assessment System: Mathematics* (1998)[12] and *Release of Test Items* (1998, 1999, 2000). These documents are available on the Department's website at **www.doe.mass.edu/mcas.**

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[12] Please note the brief update to this *Guide* provided in section B of this chapter.

F. Grade 6 MCAS Mathematics Test

Learning Standards Assessed

The grade 6 MCAS Mathematics test is based on the learning standards defined in the 2000 *Mathematics Curriculum Framework*. The grade 6 learning standards are presented in Appendix D of this document.

Test Structure

Item Types

The grade 6 MCAS Mathematics test includes multiple-choice, short-answer, and open-response questions (items). The approximate distribution of items by type on each test form is shown in Table M4 below. The table also shows how items are distributed between the common and matrix-sampled portions of the test.

Table M4. MCAS 2001 Grade 6 Mathematics Test
Approximate Number of Test Items Per Form by Type

	Item Type							
	Multiple-Choice		Short-Answer		Open-Response		Total Items Per Test Form	
	# of Items	% of Total Score	# of Items	% of Total Score	# of Items	% of Total Score	# of Items	% of Total Score
Common	29	54	5	9	5	37	**39**	**100**
Matrix-Sampled	7	—	1	—	1	—	**9**	**—**
Total Per Form	**36**	**54**	**6**	**9**	**6**	**37**	**48**	**100**

Thinking Skills

The approximate distribution of **common** score points by mathematical thinking skill is shown in Table M5 below.

Table M5. MCAS 2001 Grade 6 Mathematics Test
Approximate Percentage of Total COMMON ITEM Score Points by Mathematical Thinking Skill

Thinking Skill	Score Points	Percent of Total Points
Procedural	20	37
Conceptual	20	37
Application/Problem-Solving	14	26
Totals	**54**	**100**

Framework *Strands*

The approximate distribution of common score points by *Framework* strand is shown in Table M6 below.

Table M6. MCAS 2001 Grade 6 Mathematics Test
Approximate Percentage of Total COMMON ITEM Score Points by *Framework* Strand

***Framework* Strand**	**Score Points**	**Percent of Total Points**
Number Sense and Operations	18	33
Patterns, Relations, and Algebra	14	26
Geometry and Measurement	14	26
Data Analysis, Statistics, and Probability	8	15
Totals	**54**	**100**

Test Administration

The grade 6 MCAS Mathematics test will be administered as follows:

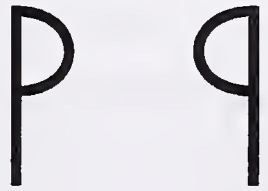
- Three test sessions (recommended time: 45 minutes per session)
- Sessions 2 and 3 may be administered on the same day.
- Calculator use is not allowed during any grade 6 MCAS Mathematics test session.
- A Grade 6 Mathematics Reference Sheet, containing formulas, and a Grade 6 Mathematics Tool Kit, containing a punch-out ruler and protractor, will be provided for student reference. Samples are provided in Appendix C of this document.

Students may use the grade 6 Mathematics Reference Sheet and Tool Kit during all test sessions. No other reference materials are allowed during any grade 6 MCAS Mathematics test session (with the exception of bilingual word-to-word dictionaries used by LEP students).

Grade 6 Mathematics Sample Items

Multiple-Choice Question

1. The figure (P) was repeated several times using a transformation to produce the pattern below.



What is the transformation?

A. translation

B. rotation

✔ C. reflection

D. projection

*Reporting Category/*Learning Standard for Item 1: ***Geometry and Measurement/*****Learning Standard 6.G.6**

Short-Answer Question

2. Compute: $16\overline{)3252}$

Correct Answer: 203.25
or equivalent

*Reporting Category/*Learning Standard for Item 2: ***Number Sense and Operations/*****Learning Standard 6.N.13**

Open-Response Questions

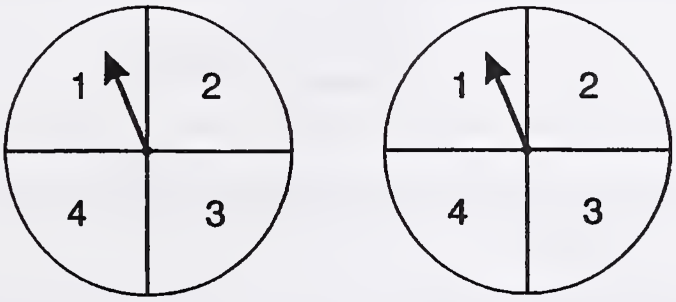
3. The Blue Jays and the Yellow Hornets are teams in a basketball league.

   a. The Blue Jays played 30 games and won 16. What is the team's ratio of wins to games played?

   b. The Yellow Hornets won 14 games and lost 11. There were no tie games. What is the team's ratio of wins to games played?

   c. Which team had a better record? Explain or show how you know.

*Reporting Category/*Learning Standard for Item 3: ***Number Sense and Operations*/Learning Standard 6.N.4**



4. Paula will use the spinners shown above to design a game.

   a. Make a tree diagram that shows all the possible outcomes of spinning each of the spinners once.

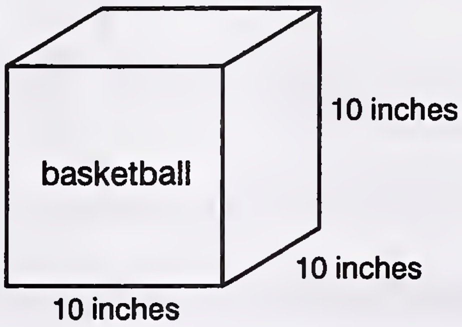
   In Paula's game, each player will spin the two spinners and add the two numbers on which the spinners land.

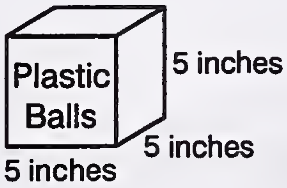
   b. What is the probability of getting a sum of 2? Explain or show how you found your answer.

   c. Which sum is **most likely**? Explain or show how you found your answer.

*Reporting Category/*Learning Standard for Item 4: ***Data Analysis, Statistics, and Probability*/Learning Standard 6.D.3**

5. Pro-V Company packs each new basketball in a cube-shaped box that measures 10 inches on each side.





a. The company wishes to ship 8 of these boxes in a carton that holds 2 layers of 4 boxes per layer with no wasted space.

- Draw a picture of the carton.
- Label the measurements of the length, width, and height of the carton.

The company wants to use the carton you designed in part (a) to ship cube-shaped boxes of plastic balls. The boxes are 5 inches on a side.

b. What is the greatest number of these 5-inch boxes that can fit into your carton? Draw a picture or use words to explain how you found your answer.

*Reporting Category/*Learning Standard for Item 5: ***Geometry and Measurement*/6.M.6**

G. Grade 8 MCAS Mathematics Test

Learning Standards Assessed

The 2001 grade 8 MCAS Mathematics test is based solely on learning standards common to both the 1996 and the 2000 *Mathematics Curriculum Frameworks.*

Moved Standards

The 2000 *Framework* moves selected learning standards from grade 8 to grades 11-12; the following standards (listed as they appeared in the 1996 *Framework*) will therefore not be tested at grade 8 in 2001:

Statistics and Probability: Probability

- model situations by devising and carrying out experiments or simulations to determine probabilities
- describe the power of using a probability model by comparing experimental results with mathematical expectations
- make predictions that are based on experimental or theoretical probabilities and determine their reasonableness
- develop and explain an appreciation for the pervasive use of probability in the real world

Additionally, the topic of recursive patterns, e.g., Fibonacci numbers, was moved to grades 9-10.

New Standards

Please see Appendix E of this document for a list of grade 8 learning standards that appear for the first time in the 2000 *Framework*. These learning standards will not be used to generate reported results in 2001.

Test Structure

Item Types

The grade 8 MCAS Mathematics test includes multiple-choice, short-answer, and open-response questions (items). The approximate distribution of items by type on each test form is shown in Table M7 below. The table also shows how items are distributed between the common and matrix-sampled portions of the test.

Table M7. MCAS 2001 Grade 8 Mathematics Test
Approximate Number of Test Items Per Form by Type

	Item Type							
	Multiple-Choice		Short-Answer		Open-Response		Total Items Per Test Form	
	# of Items	% of Total Score	# of Items	% of Total Score	# of Items	% of Total Score	# of Items	% of Total Score
Common	29	54	5	9	5	37	**39**	**100**
Matrix-Sampled	7	—	1	—	1	—	**9**	—
Total Per Form	**36**	**54**	**6**	**9**	**6**	**37**	**48**	**100**

Thinking Skills

The approximate distribution of common score points by mathematical thinking skill is shown in Table M8 below.

Table M8. MCAS 2001 Grade 8 Mathematics Test
Approximate Percentage of Total COMMON ITEM Score Points by Mathematical Thinking Skill

Thinking Skill	Score Points	Percent of Total Points
Procedural	14	26
Conceptual	16	30
Application/Problem-Solving	24	44
Totals	**54**	**100**

Framework *Strands*

The approximate distribution of common score points by *Framework* strand is shown in Table M9 below.

Table M9. MCAS 2001 Grade 8 Mathematics Test
Approximate Percentage of Total COMMON ITEM Score Points by *Framework* Strand

***Framework* Strand**	**Score Points**	**Percent of Total Points**
Number Sense and Operations	14	26
Patterns, Relations, and Algebra	15	28
Geometry and Measurement	14	26
Data Analysis, Statistics, and Probability	11	20
Totals	**54**	**100**

Test Administration

The grade 8 MCAS Mathematics test will be administered as follows:

- Three test sessions (recommended time: 45 minutes per session)
- Calculator use is **not** allowed during session 1. Calculators may be used during sessions 2 and 3 only.
- Sessions 2 and 3 may be administered on the same day.
- A Mathematics Reference Sheet is provided with the Student Test Booklet for student use.

Students may use the grade 8 Mathematics Reference Sheet during all test sessions and calculators during only sessions 2 and 3. No other reference materials are allowed during any grade 8 MCAS Mathematics test session (with the additional exception of bilingual word-to-word dictionaries used by LEP students).

Sample Items

For samples of items that appear on the grade 8 MCAS Mathematics test, see the MCAS documents, *Guide to the Massachusetts Comprehensive Assessment System: Mathematics* (1998)[13] and *Release of Test Items* (1998, 1999, 2000). These documents are available on the Department's website at www.doe.mass.edu/mcas.

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[13] Please note the brief update to this *Guide* provided in section B of this chapter.

H. Grade 10 MCAS Mathematics Test

Learning Standards Assessed

The 2001 grade 10 MCAS Mathematics test is based solely on learning standards common to both the 1996 and the 2000 *Mathematics Curriculum Frameworks.*

Moved Standards and Assessment Expectations

The 2000 *Framework* moves selected learning standards from grade 10 to higher grades; the following standards and assessment expectations (listed as they appeared in the 1996 *Framework*) will therefore not be tested at grade 10 in 2001:

Number Sense: Mathematical Structure

- identify and apply properties of other finite systems, e.g., modular systems, 2 x 2 matrices, defined operations

Patterns, Relations, and Functions: Trigonometry

- apply trigonometry to problem situations involving right triangles

Statistics and Probability: Statistics

- design a statistical experiment to study a problem, conduct the experiment, and interpret and communicate the outcomes

New Standards

Please see Appendix E of this document for a list of grade 10 learning standards that appear for the first time in the 2000 *Framework*. These learning standards will **not** be used to generate reported results in 2001.

Test Structure

Item Types

The grade 10 MCAS Mathematics test includes multiple-choice, short-answer, and open-response questions (items). The approximate distribution of test items by type is shown in Table M10. The table also shows how items are distributed between the common and matrix-sampled portions of the test.

Table M10. MCAS 2001 Grade 10 Mathematics Test
Approximate Number of Test Items Per Form by Type

	Item Type							
	Multiple-Choice		**Short-Answer**		**Open-Response**		**Total Items Per Test Form**	
	# of Items	**% of Total Score**	**# of Items**	**% of Total Score**	**# of Items**	**% of Total Score**	**# of Items**	**% of Total Score**
Common	32	53	4	7	6	40	42	100
Matrix-Sampled	7	—	1	—	1	—	9	—
Total Per Form	**39**	**53**	**5**	**7**	**7**	**40**	**51**	**100**

Thinking Skills

The approximate distribution of common score points by mathematical thinking skill is shown in Table M11 below.

Table M11. MCAS 2001 Grade 10 Mathematics Test
Approximate Percentage of Total COMMON ITEM Score Points by Mathematical Thinking Skill

Thinking Skill	Score Points	Percent of Total Points
Procedural	15	25
Conceptual	18	30
Application/Problem-Solving	27	45
Totals	**60**	**100**

Framework *Strands*

The approximate distribution of common score points by *Framework* strand is shown in Table M12 below.

Table M12. MCAS 2001 Grade 10 Mathematics Test
Approximate Percentage of Total COMMON ITEM Score Points by *Framework* Strand

Framework Strand	Score Points	Percent of Total Points
Number Sense and Operations	12	20
Patterns, Relations, and Algebra	18	30
Geometry and Measurement	18	30
Data Analysis, Statistics, and Probability	12	20
Totals	**60**	**100**

Test Administration

The grade 10 MCAS Mathematics test will be administered as follows:

- Three test sessions (recommended time: 45 minutes per session) scheduled on May 16 (session 1) and May 17 (sessions 2 and 3), 2001
- Calculator use is not allowed during **session 1.** Calculators may be used during sessions 2 and 3 only.
- A Mathematics Reference Sheet is provided with the Student Test Booklet for student use.

Students may use the grade 10 Mathematics Reference Sheet during all test sessions and calculators during only sessions 2 and 3. No other reference materials are allowed during any grade 10 MCAS Mathematics test session (with the additional exception of bilingual word-to-word dictionaries used by LEP students).

High School Competency Determination

MCAS 2001 test results will be the first MCAS results used to determine student eligibility for a high school diploma. Students who are members of the graduating class of 2003 are required to pass the grade 10 MCAS Mathematics test in order to receive a high school diploma.[14] A scaled score of 220 (the lowest score in the *Needs Improvement* performance level) or higher in Mathematics will be considered a passing score. Students who fail will be given multiple opportunities before the end of their senior year to retake the test. See the Department's website (**www.doe.mass.edu/mcas**) or call 1-800-737-5103 for more information.

Sample Items

For samples of items that appear on the grade 10 MCAS Mathematics test, see the MCAS documents, *Guide to the Massachusetts Comprehensive Assessment System: Mathematics* (1998)[15] and *Release of Test Items* (1998, 1999, 2000). These documents are available on the Department's website at **www.doe.mass.edu/mcas.**

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[14] Grade 10 students who are members of the graduating class of 2003 are also required to pass the grade 10 MCAS English Language Arts test and meet all local graduation requirements in order to receive a high school diploma.

[15] Please note the brief update to this *Guide* provided in section B of this chapter.

V. MCAS 2001
Science and Technology/Engineering Tests

V. MCAS 2001
Science and Technology/Engineering Tests

A. New 2000 Science and Technology/Engineering Curriculum Framework

The Massachusetts Board of Education adopted a revised version of the *Science & Technology Curriculum Framework* on December 20, 2000. Following is a list of highlights of the 2000 *Science and Technology/Engineering Curriculum Framework:*

- The revised learning standards are organized into narrower grade-spans (preK-2, 3-5, 6-8, and 9-10) to allow teachers to design instruction and local assessments more effectively. These groupings of learning standards allow for more specificity in assessment expectations for each grade-span.
- In order to clarify the disciplinary content of each strand, the 2000 *Framework* renames the four strands to the following four content strands: Earth Science; Life Science; The Physical Sciences; and Technology.
- Selected content changes in the 2000 *Framework* are highlighted below.
  - Several Physical Sciences learning standards were shifted to different grade-spans in order to ensure developmental appropriateness.
  - The topic of genetics has been emphasized through all grade-spans.
  - Standards in the Earth Science domain were added to include change over time.
- At the high school level, there are five sets of learning standards for one-year introductory courses in earth science, life science, chemistry, physics, and technology/engineering. The selected standards that will be assessed by MCAS tests are designated in **bold** as **core standards**.
- Also at the high school level, a two-year integrated science program for grades 9-10 will be comprised of certain core standards, which are marked by an asterisk. These integrated-science core learning standards are also summarized in Appendix I of the *Framework*.

The 2000 *Framework* is currently available on the Department's website at **www.doe.mass.edu/frameworks** under "Drafts/Updates."

B. MCAS Science & Technology Guide *Update*

Assessment Expectations and Sample Questions

The assessment expectations listed in the *Guide* no longer correlate directly with the new *Framework's* learning standards. However, the sample questions provided in the *Guide* are still helpful tools in teaching students the material assessed by the 2001 MCAS Science and Technology/Engineering tests.

Reporting and Reporting Categories

The subcategories listed in the *Guide* are no longer separately defined in the new *Framework.*

In 2001, school and district *Test Item Analysis Reports* (issued for grades 5 and 8 only) will report MCAS Science and Technology/Engineering results through the following reporting categories:

- Earth Science
- Life Science
- Physical Science
- Technology/Engineering

Please note that all information given in the *Guide*'s two chapters on "Technology" and "Science, Technology, and Human Affairs" relates to the new Technology/Engineering reporting category.

Please also see "Limited Reports of Results for 2001" in section C.

C. What's New for Science and Technology/Engineering 2001?

No MCAS Grade 4 Science & Technology Test

Grade 4 students will no longer be tested in science or technology beginning with the 2001 MCAS administration.

MCAS Grade 5 Science and Technology/Engineering Test

Because the new *Framework* groups learning standards for grades 3 through 5, a grade 5 MCAS Science and Technology/Engineering test has replaced the grade 4 test administered in previous years. This also serves to reduce MCAS testing at grade 4. The grade 5 MCAS Science and Technology/Engineering test will be based on the learning standards of the 2000 *Science and Technology/Engineering Curriculum Framework.*

Question Tryouts Only for Grades 9 and 10

For the past three years, the grade 10 MCAS Science & Technology test has assessed the learning standards of the 1996 *Science & Technology Curriculum Framework* as an "integrated" test. While several Massachusetts high schools have aligned their science programs with the 1996 *Framework* by developing integrated science and technology courses for students in grades 9 and 10, most continue to offer year-long, discipline-specific science courses in biology, chemistry, physics, earth science, and technology/engineering.

To support discipline-specific as well as integrated science curricula at the high school level, the grade 10 MCAS Science & Technology test administered in previous years will be suspended in 2001. Future MCAS tests at the high school level will include discipline-specific tests in the five areas of biology, chemistry, earth science, physics, and technology/engineering, plus an integrated science test (including biology, chemistry, earth science, and physics). The integrated test will be based on a two-year integrated science sequence. It is anticipated that students will be required to take either a total of two discipline-specific tests, one in grade 9 and one in grade 10, or one integrated test in grade 10. The Department expects these tests to be fully operational in 2003.

Field testing for these new tests will take place during the 2001 MCAS administration; students in grades 9 and 10 will participate in Question Tryouts. Please see section G of this chapter for details about the Question Tryouts and additional information about the new tests.

Limited Reports of Results for 2001

Since the MCAS Science and Technology/Engineering tests are being restructured in 2001, only limited results will be reported.

- Results for both the grade 5 and the grade 8 tests will be reported only in *Test Item Analysis Reports* provided to schools to inform curriculum development. No scaled score or performance level results will be reported for individual students, schools, or districts.
- No results will be reported for the grade 9-10 Question Tryouts.

D. Science and Technology/Engineering 2001 Test Administration Schedule

Statewide Testing and Question Tryout Administration Window:

May 14-25, 2001

E. Grade 5 MCAS
Science and Technology/Engineering Test

Learning Standards Assessed

The grade 5 MCAS Science and Technology/Engineering test is based on the learning standards of the 2000 *Science and Technology/Engineering Curriculum Framework*. The grade 5 learning standards are presented in Appendix F of this document.

Test Structure

Item Types

The grade 5 MCAS Science and Technology/Engineering test includes multiple-choice and open-response questions (items). The approximate distribution of test items by type is shown in Table ST1 below.

The table also shows how items are distributed between the common and matrix-sampled portions of the test. In order to develop a sufficient number of common items for future tests, there is a larger proportion of matrix-sampled items on the 2001 test than on other or future tests.

Table ST1. MCAS 2001 Grade 5 Science and Technology/Engineering Test
Approximate Number of Test Items Per Form by Type

	Item Type					
	Multiple-Choice		Open-Response		Total Items Per Test Form	
	# of Items	% of Total Score	# of Items	% of Total Score	# of Items	% of Total Score
Common	18	NA	2	NA	**20**	**NA**
Matrix-Sampled	23	—	4	—	**27**	**—**
Total Per Form	**41**	**NA**	**6**	**NA**	**47**	**NA**

Table ST2 shows the expected proportions of common and matrix-sampled items on the 2002 and subsequent tests.

Table ST2. MCAS 2002 Grade 5 Science and Technology/Engineering Test Approximate Number of Test Items Per Form by Type

	Item Type					
	Multiple-Choice		**Open-Response**		**Total Items Per Test Form**	
	# of Items	**% of Total Score**	**# of Items**	**% of Total Score**	**# of Items**	**% of Total Score**
Common	34	63	5	37	39	100
Matrix-Sampled	7	—	1	—	8	—
Total Per Form	41	63	6	37	47	100

Framework *Strands*

Score points will be approximately equally distributed among the *Framework* strands of Earth Science, Life Science, The Physical Sciences, and Technology/Engineering.

Test Administration

The grade 5 MCAS Science and Technology/Engineering test will be administered as follows:

- Two test sessions (recommended time: 60 minutes per session)
- Calculators are **not** allowed during **any** grade 5 Science and Technology/Engineering test session.

No reference materials are allowed during any grade 5 Science and Technology/Engineering test session (with the exception of bilingual word-to-word dictionaries used by LEP students).

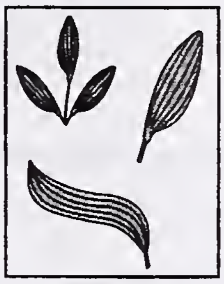
Limited Reporting of Results

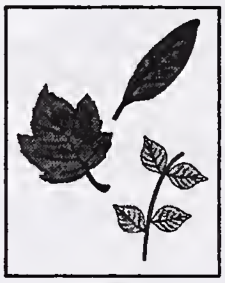
Because the 2000 *Framework* has only recently been adopted, schools need a period of time to align their curriculum and instruction. Therefore, only item analysis results will be reported in 2001 for the grade 5 MCAS Science and Technology/Engineering test. No scaled score or performance level results will be generated in 2001.

It is expected that scaled score and performance level results for this test will be fully reported for students, schools, and districts beginning in 2002.

Multiple-Choice Questions

Use the pictures below to answer question 1.


Group A


Group B

1. Luis sorted leaves into the two groups shown above. What characteristics did Luis use to sort the leaves?

✔ A. pattern of the veins

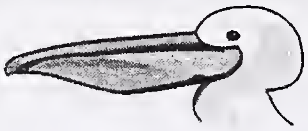
B. size of the leaves

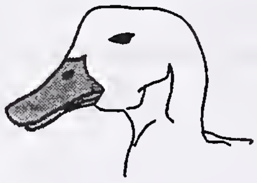
C. length of the stem

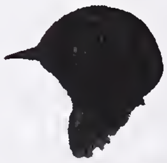
D. shape of the leaves

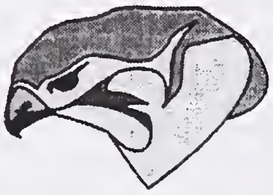
*Reporting Category/*Learning Standard for Item 1: ***Life Science/*****Learning Standard 1**

2. Based on its beak, which bird MOST LIKELY eats insects?

A. 

B. 

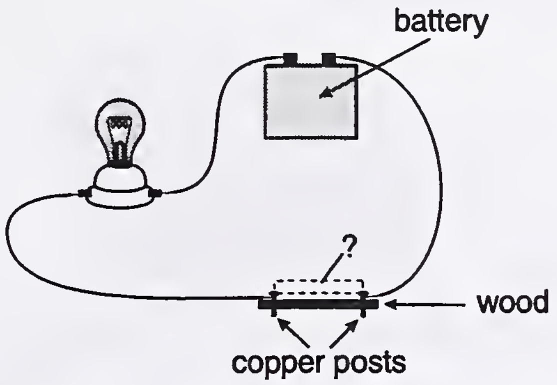
✔ C. 

D. 

*Reporting Category/*Learning Standard for Item 2: ***Life Science/*****Learning Standard 7**

Grade 5 Science and Technology/Engineering Sample Items

Use the picture below to answer question 3.



3. Charlene made a circuit with a switch. She made the posts for the switch out of copper. Which could she use to connect the posts so the bulb will light?

A. an elastic band

B. a twig

✔ C. a nail

D. a straw

*Reporting Category/*Learning Standard for Item 3: ***Physical Science/*****Learning Standard 7**

Use the information below to answer question 4.

In colonial times, there were no refrigerators or freezers.
People cut ice from lakes or ponds during the winter and stored the ice in icehouses.
They used hay or sawdust as insulators to prevent the ice from melting.

4. If you wanted to build an icehouse today, which would be the BEST material to use as an insulator?

A. wet leaves

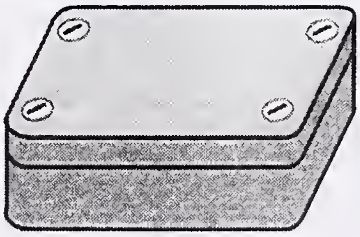
✔ B. plastic foam

C. plastic wrap

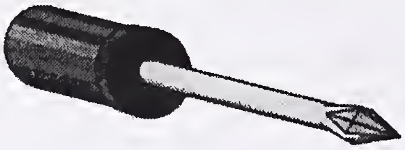
D. rock salt

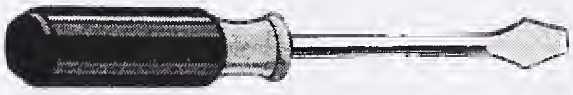
*Reporting Category/*Learning Standard for Item 4: ***Technology/*****Learning Standard 2.1**

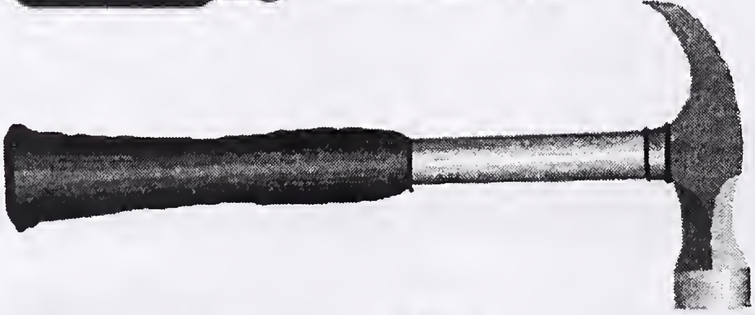
Use the diagram below to answer question 5.

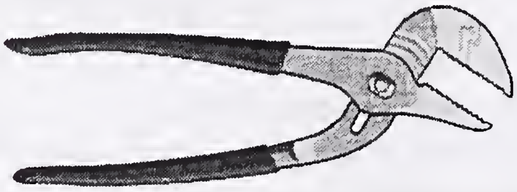


5. Which tool would be BEST to open this box so that it could be put back together in the same way?

A. 

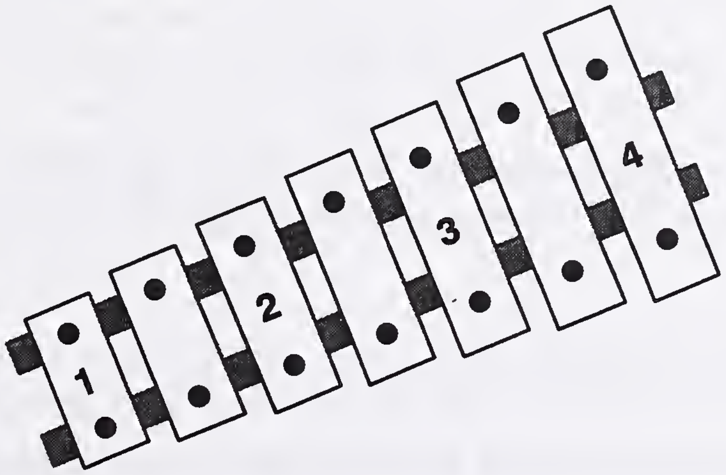
✔ B. 

C. 

D. 

Reporting Category/Learning Standard for Item 5: ***Technology*/Learning Standard 1.2**

Use the picture below to answer question 6.



6. Which bar on the instrument will produce the sound with the lowest pitch when struck?

   A. bar 1

   B. bar 2

   C. bar 3

   ✓ D. bar 4

*Reporting Category/*Learning Standard for Item 6: ***Physical Science/*****Learning Standard 11**

Open-Response Question

7. Paula has been recording weather information in her science journal. Her journal entries are shown below.

March 1	March 15	March 29	April 5	April 15
snow 25°F	clear blue sky 40°F	rainy 45°F	clear did not need my jacket	60°F I watched the sky and saw clouds shaped like dragons, dogs, and rockets

a. Use the table below to organize the data from her journal. Fill in any information from Paula's journal entries that fits the table.

b. There are spaces in the data table where you have no information. Based on what you have learned from the journal, predict what the missing information might be by completing your data table.

Date	Temperature	Cloudy or Clear?	Precipitation

*Reporting Category/*Learning Standard for Item 7: ***Earth Science/*****Learning Standard 6**

F. Grade 8 MCAS
Science and Technology/Engineering Test

Learning Standards Assessed

The grade 8 MCAS Science and Technology/Engineering test is based on the learning standards of the 2000 *Science and Technology/Engineering Curriculum Framework,* which is available on the Department's website at www.doe.mass.edu/frameworks, under "Drafts/Updates."

Test Structure

Item Types

The grade 8 MCAS Science and Technology/Engineering test includes multiple-choice and open-response questions (items). The approximate distribution of items by type on each test form is shown in Table ST3 below.

The table also shows how items are distributed between the common and matrix-sampled portions of the test. In order to develop a sufficient number of common items for future tests, there is a larger proportion of matrix-sampled items on the 2001 test than on other or future tests.

Table ST3. MCAS 2001 Grade 8 Science and Technology/Engineering Test Approximate Number of Test Items Per Form by Type

	Item Type					
	Multiple-Choice		Open-Response		Total Items Per Test Form	
	# of Items	% of Total Score	# of Items	% of Total Score	# of Items	% of Total Score
Common	18	NA	2	NA	20	NA
Matrix-Sampled	23	—	4	—	27	—
Total Per Form	41	NA	6	NA	47	NA

Table ST4 shows the expected proportions of common and matrix-sampled items on the 2002 and subsequent tests.

Table ST4. MCAS 2002 Grade 8 Science and Technology/Engineering Test Approximate Number of Test Items Per Form by Type

	Item Type					
	Multiple-Choice		**Open-Response**		**Total Items Per Test Form**	
	# of Items	% of Total Score	# of Items	% of Total Score	# of Items	% of Total Score
Common	18	69	2	31	**20**	**100**
Matrix-Sampled	23	—	4	—	**27**	—
Total Per Form	**41**	**69**	**6**	**31**	**47**	**100**

Framework *Strands*

Score points will be approximately equally distributed among the *Framework* strands of Earth Science, Life Science, The Physical Sciences, and Technology/Engineering.

Test Administration

The grade 8 MCAS Science and Technology/Engineering test will be administered as follows:

- Three test sessions (recommended time: 45 minutes per session)
- Sessions 2 and 3 may be administered on the same day.
- Calculators are **not** allowed during **any** grade 8 Science and Technology/Engineering test session.

No reference materials are allowed during any grade 8 Science and Technology/Engineering test session (with the exception of bilingual word-to-word dictionaries used by LEP students).

Sample Items

Many of the MCAS *Guide*'s sample questions and the items released in the *Release of Test Items* documents for 1998, 1999, and 2000 illustrate how the 2001 test will assess the learning standards of the 2000 *Framework*. These documents are available on the Department's website at **www.doe.mass.edu/mcas.**

Limited Reporting of Results

Because the 2000 *Framework* has only recently been adopted, schools need a period of time to align their curriculum and instruction. Therefore, only item analysis results will be reported in 2001 for the grade 8 MCAS Science and Technology/Engineering test. No scaled score or performance level results will be generated in 2001.

It is expected that scaled score and performance level results for this test will be fully reported for students, schools, and districts beginning in 2002.

G. Grade 9-10 MCAS Science and Technology/Engineering Question Tryouts

Question Tryouts for 2001

To support discipline-specific as well as integrated science curricula at the high school level, the grade 10 MCAS Science & Technology test administered in previous years will be suspended in 2001 to accommodate restructuring of future tests.

In its place, students in grades 9 and 10 who are enrolled in a course in one of the areas listed below will participate in one of the following Question Tryouts during the MCAS 2001 administration:

- Biology
- Chemistry
- Earth Science
- Technology/Engineering
- Physics (Introductory)
- Integrated Science (including biology, chemistry, physics, and earth science)

The purpose of MCAS Question Tryouts is to gather information to evaluate the quality of newly developed test items. Accordingly, no scaled score or performance level results for students, schools, or districts will be generated on the basis of these Question Tryouts.

It is anticipated that new MCAS tests in these areas will be fully operational by the 2003 MCAS administration. The Department recognizes that there are many policy-related questions that will first need to be answered regarding this new initiative, and expects that these issues will be addressed by the Board of Education beginning in spring 2001. The Commissioner of Education looks forward to your suggestions and comments.

Tryout Participation

All students in grades 9 and 10 who are enrolled in a course for one of the above-mentioned areas will participate in a Question Tryout in that area during the 2001 MCAS administration. For example, grade 10 students who are taking biology this year will participate in the Biology Question Tryout.

The Question Tryout for integrated science will only be administered to students who are completing the second year-long course of a two-year integrated science sequence. The 2002 MCAS Integrated Science test is currently planned to be administered only to grade 10 students who participated in a two-year integrated science sequence during grades 9 and 10.

No student will participate in more than one Question Tryout. Students not enrolled in any of the aforementioned courses will not be required to participate.

Learning Standards Assessed by Question Tryouts

All Question Tryouts are based on the learning standards of the 2000 *Science and Technology/Engineering Curriculum Framework*, which is available on the Department's website at www.doe.mass.edu/frameworks, under "Drafts/Updates."

Test Structure

Item Types

Each Question Tryout includes multiple-choice and open-response questions (items). The approximate distribution of items by type on each Question Tryout form is shown in Table ST5 below.

Table ST5. MCAS 2001 Grade 9-10 Science and Technology/Engineering Question Tryouts Approximate Number of Items Per Form by Type

Multiple-Choice	Open-Response	Total Items Per Test Form
25	2	27

Framework *Strands*

Items on each discipline-specific Question Tryout will be based entirely on that discipline's content. Items on the Integrated Science Question Tryout will be based on the content areas of biology, chemistry, physics, and earth science.

Question Tryout Administration

The Question Tryouts will be administered as follows:

- One 45-minute session per Question Tryout
- Calculators are allowed **only** on the **Chemistry** and **Physics** Question Tryouts. All MCAS Question Tryout items that rely on a calculator are developed assuming a four-function calculator with a square root key. Although students are permitted to use more sophisticated calculators, these calculators offer no testing advantage over a four-function calculator with a square root key.
- MCAS Formula Sheets containing relevant mathematical formulas will be provided with both the Chemistry and the Physics Question Tryout Booklets for student use. A periodic table and a list of polyatomic ions will also be provided for student use with the Chemistry Question Tryout Booklet.[16]

Other than the calculators, MCAS Formula Sheets, and tables mentioned above, no reference materials will be allowed during any Question Tryout session (with the exception of bilingual word-to-word dictionaries used by LEP students).

No Reporting of Results

No results will be generated or reported for any Question Tryout.

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[16] The families on the periodic table will be labeled with both the common American usage (1A through 8A) and the labels recommended by the International Union of Pure and Applied Chemistry (1–18).

VI. MCAS 2001
History and Social Science Tests

VI. MCAS 2001 History and Social Science Tests

The MCAS 2001 History and Social Science tests are based on the 1997 *History and Social Science Curriculum Framework*.[17]

A. MCAS History and Social Science Guide *Update*

Information given in the publication, *Guide to the Massachusetts Comprehensive Assessment System: History and Social Science, Spring 1999*, for grades 8 and 10 is still applicable to the 2001 tests in those grades.

Reporting and Reporting Categories

Individual students receive one MCAS History and Social Science score/performance level.

School and district MCAS History and Social Science results are reported through the following reporting categories:

- U.S. History (except for grade 10)
- World History
- Geography
- Economics
- Civics and Government

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[17] A draft of a revised *History and Social Science Curriculum Framework* is being prepared for review by the Massachusetts Board of Education. Following a public comment period, the revised *Framework* is expected to be finalized in 2001 and to serve as the basis for future MCAS History and Social Science tests.

B. What's New for History and Social Science 2001?

No MCAS Grade 4 History and Social Science Test

Grade 4 students will no longer be tested in history or social science beginning with the 2001 MCAS administration.

MCAS Grade 5 History and Social Science Test

A grade 5 MCAS History and Social Science test will be administered for the first time in 2001. This grade 5 test replaces the grade 4 test administered in past years, and serves to reduce MCAS testing at grade 4.

MCAS Grade 10 History and Social Science Test

The grade 10 MCAS History and Social Science test has been restructured to be administered in two 60-minute test sessions (rather than three 45-minute sessions).

C. History and Social Science 2001 Test Administration Schedule

Statewide Testing Window:
May 14-25, 2001

D. Grade 5 MCAS History and Social Science Test

Core Knowledge Topics Assessed

The grade 5 MCAS History and Social Science test assesses the following *Framework* core knowledge topics:

- The United States, 1(a) through 3(g)
- The World, 1(a) through 1(d)

These core knowledge topics are presented in Appendix G of this document, along with the *Framework* learning standards assessed by MCAS.

Test Structure

Item Types

The grade 5 MCAS History and Social Science test includes multiple-choice and open-response questions (items). The approximate distribution of items by type on each test form is shown in Table H1 below. The table also shows how items are distributed between the common and matrix-sampled portions of the test.

Table H1. MCAS 2001 Grade 5 History and Social Science Test
Approximate Number of Test Items Per Form by Type

	Item Type					
	Multiple-Choice		**Open-Response**		**Total Items Per Test Form**	
	# of Items	**% of Total Score**	**# of Items**	**% of Total Score**	**# of Items**	**% of Total Score**
Common	34	NA	5	NA	**39**	**NA**
Matrix-Sampled	7	—	1	—	**8**	**—**
Total Per Form	**41**	**NA**	**6**	**NA**	**47**	**NA**

Framework *Strands*

The approximate distribution of common score points by *Framework* strand is shown in Table H2 below.

Table H2. MCAS 2001 Grade 5 History and Social Science Test
Approximate Percentage of Total COMMON ITEM Score Points by *Framework* Strand

***Framework* Strand**	**Score Points**	**Percent of Total Points**
History U.S. History	24	NA
World History	12	NA
Geography	6	NA
Economics	6	NA
Civics and Government	6	NA
Totals	**54**	**NA**

Framework *Core Knowledge Topics*

The approximate distribution of common score points by *Framework* core knowledge topic is shown in Table H3 below.

Table H3. MCAS 2001 Grade 5 History and Social Science Test
Approximate Percentage of Total COMMON ITEM Score Points by *Framework* Core Knowledge Topic

***Framework* Core Knowledge Topic**	**Score Points**	**Percent of Total Points for Items Associated with a Core Knowledge Topic**	
		U.S. History	**World History**
Early America and the Americans (Beginnings to 1650)	10	18	▨
Settlements, Colonies, and Emerging American Identity (1600 to 1763)	5	9	▨
The American Revolution: Creating a New Nation (1750 to 1815)	9	17	▨
Human Beginnings and Early Civilizations (Prehistory to 1000 B.C.)	12	▨	22
Totals	**36**	**44**	**22**

Test Administration

The grade 5 MCAS History and Social Science test will be administered in two test sessions (recommended time: 60 minutes per session).

No reference materials are allowed during any grade 5 History and Social Science test session (with the exception of bilingual word-to-word dictionaries used by LEP students).

Limited Reporting of Results

Only item analysis results will be reported in 2001 for the grade 5 MCAS History and Social Science test. No scaled score or performance level results will be generated in 2001.

It is expected that scaled score and performance level results for this test will be fully reported for students, schools, and districts beginning in 2002.

Grade 5 History and Social Science Sample Items

Multiple-Choice Questions

1. The first leader of the Jamestown settlement was

A. Lord Baltimore.

B. Miles Standish.

✓ C. John Smith.

D. William Penn.

Item 1
Reporting Category/Learning Standard: ***U.S. History*/Historical Understanding**
Core Knowledge Topic: **Early America and the Americans (Beginnings to 1650)**

2. In ancient civilizations, permanent settlements developed mainly because of an

A. abundance of weapons.

✓ B. introduction of farming.

C. increase in hunting.

D. ability to make pottery.

Item 2
Reporting Category/Learning Standard: ***World History*/Interdisciplinary Learning: Natural Science, Mathematics, and Technology in History**
Core Knowledge Topic: **Human Beginnings and Early Civilizations (Prehistory to 1000 B.C.)**

3. Native Americans played a key role in the survival of the Plymouth Colony by

✓ A. teaching colonists how to grow crops successfully.

B. helping the colonists write laws.

C. speaking to the British government about providing more supplies.

D. working with colonists to establish new sea routes.

Item 3
Reporting Category/Learning Standard: ***U.S. History*/Historical Understanding**
Core Knowledge Topic: **Settlements, Colonies, and Emerging American Identity (1600 to 1763)**

4. The quotation below is about a climate region of the United States.

> "I live in a climate region where there is a lot of open land and it is very dry."

Which climate region does the person live in?

✔ A. southwest

B. northeast

C. southeast

D. northwest

Item 4
Reporting Category/Learning Standard: ***Geography***/**Physical Spaces of the Earth**
Core Knowledge Topic: **Not Applicable**

5. In the United States, most of our political rights come from the

A. Declaration of Independence.

✔ B. United States Constitution.

C. Magna Carta.

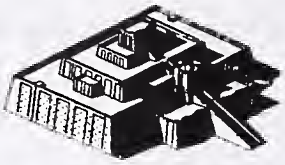
D. Mayflower Compact.

Item 5
Reporting Category/Learning Standard: ***Civics and Government***/**The Founding Documents**
Core Knowledge Topic: **Not Applicable**

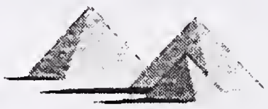
Grade 5 History and Social Science Sample Items

Open-Response Questions

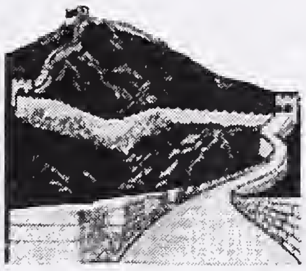
6. Look at the pictures below.



Ziggurats



Pyramids



Great Wall

Choose ONE of the pictures to answer parts a, b, and c.

a. Write the name of the structure you have chosen.

b. Name which civilization built the structure.

c. Explain why the structure was important to the people who built it.

Item 6
Reporting Category/Learning Standard: ***World History*/Historical Understanding**
Core Knowledge Topic: **Human Beginnings and Early Civilizations (Prehistory to 1000 B.C.)**

7. Four New England leaders of the Revolutionary War are listed below.

- Samuel Adams
- Ethan Allen
- Nathan Hale
- Paul Revere

Choose ONE of the leaders from the list to answer parts a and b.

a. Write the leader's name.

b. Describe how this leader was involved in the American Revolution.

Item 7
Reporting Category/Learning Standard: ***U.S. History*/Chronology and Cause**
Core Knowledge Topic: **The American Revolution: Creating a New Nation (1750 to 1815)**

E. Grade 8 MCAS History and Social Science Test

Core Knowledge Topics Assessed

The grade 8 MCAS History and Social Science test assesses the following *Framework* core knowledge topics:

- The United States, 3(d) through 5(i)
- The World, 1(a) through 3(c)

These core knowledge topics are presented in Appendix G of this document, along with the *Framework* learning standards assessed by MCAS.

Test Structure

Item Types

The grade 8 MCAS History and Social Science test includes multiple-choice and open-response questions (items). The approximate distribution of items by type on each test form is shown in Table H4 below. The table also shows how items are distributed between the common and matrix-sampled portions of the test.

Table H4. MCAS 2001 Grade 8 History and Social Science Test
Approximate Number of Test Items Per Form by Type

	Item Type					
	Multiple-Choice		Open-Response		Total Items Per Test Form	
	# of Items	% of Total Score	# of Items	% of Total Score	# of Items	% of Total Score
Common	34	63	5	37	**39**	**100**
Matrix-Sampled	7	—	1	—	**8**	—
Total Per Form	**41**	**63**	**6**	**37**	**47**	**100**

Framework *Strands*

The approximate distribution of common score points by *Framework* strand is shown in Table H5 below.

Table H5. MCAS 2001 Grade 8 History and Social Science Test
Approximate Percentage of Total COMMON ITEM Score Points by *Framework* Strand

Framework Strand	Score Points	Percent of Total Points
History U.S. History	24	44
World History	12	22
Geography	7	13
Economics	6	11
Civics and Government	5	10
Totals	**54**	**100**

Framework *Core Knowledge Topics*

The approximate distribution of common score points by *Framework* core knowledge topic is shown in Table H6 below.

Table H6. MCAS 2001 Grade 8 History and Social Science Test
Approximate Percentage of Total COMMON ITEM Score Points by *Framework* Core Knowledge Topic

Framework Core Knowledge Topic	Score Points	Percent of Total Points for Items Associated with a Core Knowledge Topic	
		U.S. History	World History
The American Revolution: Creating a New Nation (1750 to 1815)	5	9	
Expansion, Reform, and Economic Growth (1800 to 1861)	9	17	
The Civil War and Reconstruction (1850 to 1877)	10	18	
Human Beginnings and Early Civilizations (Prehistory to 1000 B.C.)	2		4
Classical Civilizations of the Ancient World (1000 B.C. to c. 500 A.D.)	9		16
Growth of Agricultural and Commercial Civilizations (500 to 1500 A.D.)	1		2
Totals	**36**	**44**	**22**

Test Administration

The grade 8 MCAS History and Social Science test will be administered in **three test sessions** (recommended time: 45 minutes per session).

No reference materials are allowed during any grade 8 History and Social Science test session (with the exception of bilingual word-to-word dictionaries used by LEP students).

Sample Items

For samples of items that appear on the grade 8 MCAS History and Social Science test, see the MCAS documents, *Guide to the Massachusetts Comprehensive Assessment System: History and Social Science, Spring 1999* and *Release of Test Items* (1998, 1999, 2000). These documents are available on the Department's website at **www.doe.mass.edu/mcas.**

F. Grade 10 MCAS History and Social Science Test

Core Knowledge Topics Assessed

The grade 10 MCAS History and Social Science test assesses the following *Framework* core knowledge topics:

- The World, 3(a) through 7(k)

These core knowledge topics are presented in Appendix G of this document, along with the *Framework* learning standards assessed by MCAS.

Grade 10 students are not tested on any United States core knowledge topic; any questions related to the United States involve the United States as it relates to the "world stage."

Test Structure

Item Types

The grade 10 MCAS History and Social Science test includes multiple-choice and open-response questions (items). The approximate distribution of items by type on each test form is shown in Table H7 below. The table also shows how items are distributed between the common and matrix-sampled portions of the test.

Table H7. MCAS 2001 Grade 10 History and Social Science Test Approximate Number of Test Items Per Form by Type

	Item Type					
	Multiple-Choice		**Open-Response**		**Total Items Per Test Form**	
	# of Items	**% of Total Score**	**# of Items**	**% of Total Score**	**# of Items**	**% of Total Score**
Common	36	NA	6	NA	42	NA
Matrix-Sampled	6	—	1	—	7	—
Total Per Form	42	NA	7	NA	49	NA

Framework *Strands*

The approximate distribution of common score points by *Framework* strand is shown in Table H8 below.

Table H8. MCAS 2001 Grade 10 History and Social Science Test
Approximate Percentage of Total COMMON ITEM Score Points by *Framework* Strand

Framework Strand	Score Points	Percent of Total Points
History: World History	40	NA
Geography	6	NA
Economics	7	NA
Civics and Government	7	NA
Totals	**60**	**NA**

Framework *Core Knowledge Topics*

The approximate distribution of common score points by *Framework* core knowledge topic is shown in Table H9 below.

Table H9. MCAS 2001 Grade 10 History and Social Science Test
Approximate Percentage of Total COMMON ITEM Score Points by *Framework* Core Knowledge Topic

Framework Core Knowledge Topic	Score Points	Percent of Total Points for Items Associated with a Core Knowledge Topic
Growth of Agricultural and Commercial Civilizations (500 to 1500 A.D.)	10	NA
Emergence of a Global Age (1450 to 1750)	8	NA
The Age of Revolutionary Change (1700 to 1914)	7	NA
The World in the Era of Great Wars (1900 to 1945)	7	NA
The World from 1945 to the Present	8	NA
Totals	**40**	**NA**

Test Administration

The grade 10 MCAS History and Social Science test will be administered in two test sessions (recommended time: 60 minutes per session).

No reference materials will be allowed during any grade 10 History and Social Science test session (with the exception of bilingual word-to-word dictionaries used by LEP students).

Sample Items

For samples of items that appear on the grade 10 MCAS History and Social Science test, see the MCAS documents, *Guide to the Massachusetts Comprehensive Assessment System: History and Social Science, Spring 1999* and *Release of Test Items* (1998, 1999, 2000). These documents are available on the Department's website at www.doe.mass.edu/mcas.

Appendix A

English Language Arts Reading Passage Copyrights

English Language Arts Reading Passage Copyrights

Grade 3 Reading

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Grade 7 ELA Language and Literature

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Appendix B

English Language Arts Curriculum Framework
Learning Standards Assessed by MCAS

English Language Arts Curriculum Framework
Learning Standards Assessed by MCAS

Language Strand

Learning Standard 4

Students will acquire and use correctly an advanced reading vocabulary of English words, identifying meanings through an understanding of word relationships.

Learning Standard 5

Students will identify, describe, and apply knowledge of the structure of the English language and standard English conventions for sentence structure, usage, punctuation, capitalization, and spelling.

Learning Standard 6

Students will describe and analyze how oral dialects differ from each other in English, how they differ from written standard English, and what role standard American English plays in informal and formal communication.

Learning Standard 7

Students will describe and analyze how the English language has developed and been influenced by other languages.

Appendix B

Literature Strand

Learning Standard 8

Students will decode accurately and understand new words encountered in their reading materials, drawing on a variety of strategies as needed, and then use these words accurately in . . . writing.

Learning Standard 9

Students will identify the basic facts and essential ideas in what they have read, heard, or viewed.

Learning Standard 10

Students will identify, analyze, and apply knowledge of the characteristics of different genres.

Learning Standard 11

Students will identify, analyze, and apply knowledge of theme in literature and provide evidence from the text to support their understanding.

Learning Standard 12

Students will identify, analyze, and apply knowledge of the structure and elements of fiction and provide evidence from the text to support their understanding.

Learning Standard 13

Students will identify, analyze, and apply knowledge of the structure, elements, and meaning of nonfiction or informational material and provide evidence from the text to support their understanding.

Learning Standard 14

Students will identify, analyze, and apply knowledge of the structure, elements, and theme of poetry and provide evidence from the text to support their understanding.

Learning Standard 15

Students will identify and analyze how an author's choice of words appeals to the senses, creates imagery, suggests mood, and sets tone.

Learning Standard 16

Students will compare and contrast similar myths and narratives from different cultures and geographic regions.

Learning Standard 17

Students will interpret the meaning of literary works, nonfiction, films, and media by using different critical lenses and analytic techniques.

Composition Strand

Learning Standard 19

Students will write compositions with a clear focus, logically related ideas to develop it, and adequate detail.

Learning Standard 20

Students will select and use appropriate genres, modes of reasoning, and speaking styles when writing for different audiences and rhetorical purposes.

Learning Standard 21

Students will demonstrate improvement in organization, content, paragraph development, level of detail, style, tone, and word choice (diction) in their compositions after revising them.

Learning Standard 22

Students will use knowledge of standard English conventions to edit their writing.

Appendix C

Sample Grade 6
MCAS Mathematics Reference Sheet
and Tool Kit

Sample Grade 6 MCAS Mathematics Reference Sheet

AREA FORMULAS

Square: $A = s \bullet s$ or lw

Rectangle: $A = bh$
OR
$A = lw$

Parallelogram: $A = bh$

Triangle: $A = \frac{1}{2}bh$

PERIMETER FORMULAS

Square: $P = 4s$

Rectangle: $P = 2b + 2h$
OR
$P = 2l + 2w$

Triangle: $P = a + b + c$
OR
Perimeter = distance around

VOLUME FORMULAS

Rectangular prism: $V = lwh$

CIRCLE FORMULAS

$C = 2\pi r$
OR
$C = \pi d$

$A = \pi r^2$

CONVERSIONS

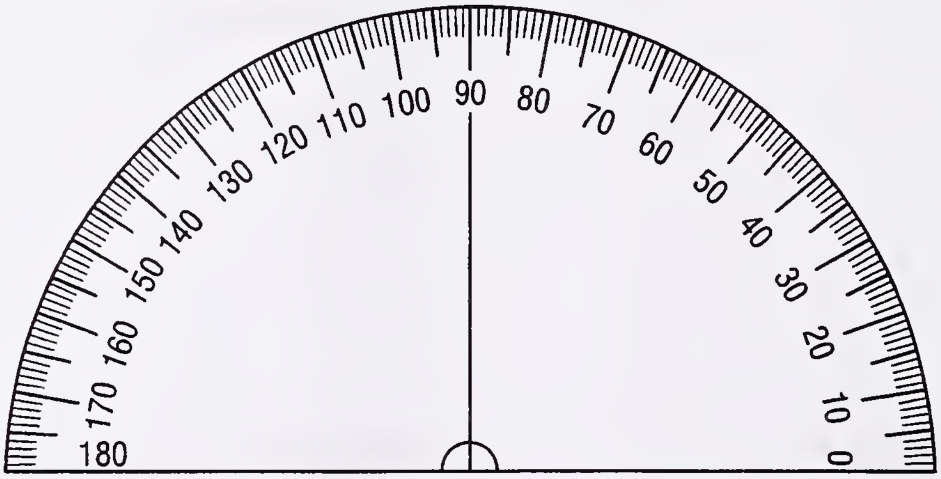
3 feet = 1 yard

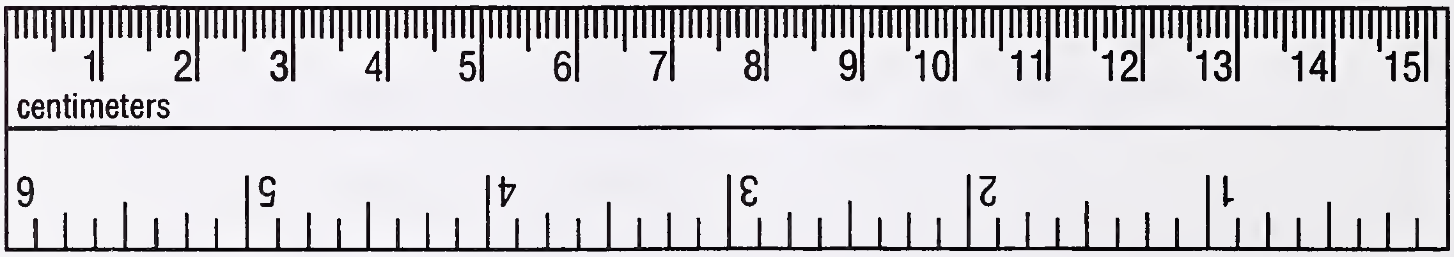
5280 feet = 1 mile

60 seconds = 1 minute

60 minutes = 1 hour

Sample Grade 6 MCAS Mathematics Tool Kit





Appendix D

2000 *Mathematics Curriculum Framework* Grade 6 Learning Standards Assessed by MCAS

2000 Mathematics Curriculum Framework
Grade 6 Learning Standards Assessed by MCAS

Number Sense and Operations

Students engage in problem solving, communicating, reasoning, connecting, and representing as they:

6.N.1 Demonstrate an understanding of positive integer exponents, in particular, when used in powers of ten, e.g., 10^2, 10^5.

6.N.2 Demonstrate an understanding of place value to billions and thousandths.

6.N.3 Represent and compare very large (billions) and very small (thousandths) positive numbers in various forms such as expanded notation without exponents, e.g., 9724 = 9 x 1000 + 7 x 100 + 2 x 10 + 4.

6.N.4 Demonstrate an understanding of fractions as a ratio of whole numbers, as parts of unit wholes, as parts of a collection, and as locations on the number line.

6.N.5 Identify and determine common equivalent fractions, mixed numbers, decimals, and percents.

6.N.6 Find and position integers, fractions, mixed numbers, and decimals (both positive and negative) on the number line.

6.N.7 Compare and order integers (including negative integers) and positive fractions, mixed numbers, decimals, and percents.

6.N.8 Apply number theory concepts—including prime and composite numbers, prime factorization, greatest common factor, least common multiple, and divisibility rules for 2, 3, 4, 5, 6, 9, and 10—to the solution of problems.

6.N.9 Select and use appropriate operations to solve problems involving addition, subtraction, multiplication, division, and positive integer exponents with whole numbers, and with positive fractions, mixed numbers, decimals, and percents.

6.N.10 Use the number line to model addition and subtraction of integers, with the exception of subtracting negative integers.

6.N.11 Apply the Order of Operations for expressions involving addition, subtraction, multiplication, and division with grouping symbols (+, –, x, ÷).

6.N.12 Demonstrate an understanding of the inverse relationship of addition and subtraction, and use that understanding to simplify computation and solve problems.

6.N.13 Accurately and efficiently add, subtract, multiply, and divide (with double-digit divisors) whole numbers and positive decimals.

6.N.14 Accurately and efficiently add, subtract, multiply, and divide positive fractions and mixed numbers. Simplify fractions.

6.N.15 Add and subtract integers, with the exception of subtracting negative integers.

6.N.16 Estimate results of computations with whole numbers, and with positive fractions, mixed numbers, decimals, and percents. Describe reasonableness of estimates.

Patterns, Relations, and Algebra

Students engage in problem solving, communicating, reasoning, connecting, and representing as they:

6.P.1 Analyze and determine the rules for extending symbolic, arithmetic, and geometric patterns and progressions, e.g., ABBCCC; 1, 5, 9, 13 . . . ; 3, 9, 27, . . .

6.P.2 Replace variables with given values and evaluate/simplify, e.g., 2(O) + 3 when O = 4.

6.P.3 Use the properties of equality to solve problems, e.g., if ■ + 7 = 13, then ■ = 13 – 7, therefore ■ = 6; if 3 x ■ = 15, then 1/3 x 3 x ■ = 1/3 x 15, therefore ■ = 5.

6.P.4 Represent real situations and mathematical relationships with concrete models, tables, graphs, and rules in words and with symbols, e.g., input-output tables.

6.P.5 Solve linear equations using concrete models, tables, graphs, and paper-pencil methods.

6.P.6 Produce and interpret graphs that represent the relationship between two variables in everyday situations.

6.P.7 Identify and describe relationships between two variables with a constant rate of change. Contrast these with relationships where the rate of change is not constant.

Geometry

Students engage in problem solving, communicating, reasoning, connecting, and representing as they:

6.G.1 Identify polygons based on their properties, including types of interior angles, perpendicular or parallel sides, and congruence of sides, e.g., squares, rectangles, rhombuses, parallelograms, trapezoids, and isosceles, equilateral, and right triangles.

6.G.2 Identify three-dimensional shapes (e.g., cubes, prisms, spheres, cones, and pyramids) based on their properties, such as edges and faces.

6.G.3 Identify relationships among points, lines, and planes, e.g., intersecting, parallel, perpendicular.

6.G.4 Graph points and identify coordinates of points on the Cartesian coordinate plane (all four quadrants). **[Note: Only the first quadrant will be tested in 2001.]**

6.G.5 Find the distance between two points on horizontal or vertical number lines.

6.G.6 Predict, describe, and perform transformations on two-dimensional shapes, e.g., translations, rotations, and reflections.

6.G.7 Identify types of symmetry, including line and rotational.

6.G.8 Determine if two shapes are congruent by measuring sides or a combination of sides and angles, as necessary; or by motions or series of motions, e.g., translations, rotations, and reflections.

6.G.9 Match three-dimensional objects and their two-dimensional representations, e.g., nets, projections, and perspective drawings.

Measurement

Students engage in problem solving, communicating, reasoning, connecting, and representing as they:

6.M.1 Apply the concepts of perimeter and area to the solution of problems. Apply formulas where appropriate.

6.M.2 Identify, measure, describe, classify, and construct various angles, triangles, and quadrilaterals.

6.M.3 Solve problems involving proportional relationships and units of measurement, e.g., same system unit conversions, scale models, maps, and speed.

6.M.4 Find areas of triangles and parallelograms. Recognize that shapes with the same number of sides but different appearances can have the same area. Develop strategies to find the area of more complex shapes.

6.M.5 Identify, measure, and describe circles and the relationships of the radius, diameter, circumference, and area (e.g., d – 2r, p – C/d), and use the concepts to solve problems.

6.M.6 Find volumes and surface areas of rectangular prisms.

6.M.7 Find the sum of the angles in simple polygons (up to eight sides) with and without measuring the angles.

Data Analysis, Statistics, and Probability

Students engage in problem solving, communicating, reasoning, connecting, and representing as they:

6.D.1 Describe and compare data sets using the concepts of median, mean, mode, maximum and minimum, and range.

6.D.2 Construct and interpret stem-and-leaf plots, line plots, and circle graphs.

6.D.3 Use tree diagrams and other models (e.g., lists and tables) to represent possible or actual outcomes of trials. Analyze the outcomes.

6.D.4 Predict the probability of outcomes of simple experiments (e.g., tossing a coin, rolling a die) and test the predictions. Use appropriate ratios between 0 and 1 to represent the probability of the outcome and associate the probability with the likelihood of the event.

Appendix E

New 2000 *Mathematics Curriculum Framework* Learning Standards

Appendix E

The following learning standards listed in the 2000 *Mathematics Curriculum Framework* did not appear in the 1996 *Framework*. Some matrix-sampled questions on the 2001 test may test these standards; however, no student, school, or district scaled score or performance level results reported in 2001 will be generated based on those questions.

Grade 4

Number Sense and Operations

Learning Standard 4.N.9.

- Select, [use,] and explain the commutative, associative, and identity properties of operations on whole numbers in problem situations, e.g., 37 x 46 = 46 x 37, (5 x 7) x 2 = 5 x (7 x 2).

  NOTE: Grade 4 students WILL be tested on their ability to use mathematical operations (addition, subtraction, multiplication, and division) and on their ability to recognize and use the commutative properties for addition and multiplication. They will not be tested in 2001 on their ability to select or explain the commutative, associative, or identity properties of these operations.

Learning Standard 4.N.11.

- Know multiplication facts through 12 x 12 and related division facts. Use these facts to solve related multiplication problems and compute related problems, e.g., 3 x 5 is related to 30 x 50, 300 x 5, and 30 x 500.

Please note that **Learning Standards 4.N.12, 4.N.14, and 4.N.15** are also new to the 2000 *Framework,* but are intended to be assessed locally; they cannot be tested in a large-scale, paper-and-pencil format and will not be tested by MCAS. However, students will be tested in 2001 on the multiplication of two digits by two digits.

Geometry

Learning Standard 4.G.3.

- Recognize similar figures.

Measurement

Learning Standard 4.M.5, regarding

- angle ruler

and

- angle size.

All other parts of this learning standard will be tested in 2001.

Appendix E

The following learning standards listed in the 2000 *Mathematics Curriculum Framework* did not appear in the 1996 *Framework*. Some matrix-sampled questions on the 2001 test may test these standards; however, no student, school, or district scaled score or performance level results reported in 2001 will be generated based on those questions.

Grade 8

Number Sense and Operations

Learning Standard 8.N.6.

- Demonstrate an understanding of absolute value, e.g., $|-3| = |3| = 3$.

Measurement

Learning Standard 8.M.3, regarding

- Given the formulas, determine the surface area and volume of rectangular prisms, cylinders, and spheres.

All other parts of this learning standard will be tested in 2001.

Data Analysis, Statistics, and Probability

Learning Standard 8.D.2, regarding

- Venn diagrams, stem-and-leaf plots, and box-and-whisker plots

and

- Differentiate between continuous and discrete data and ways to represent them.

All other parts of this learning standard will be tested in 2001.

Appendix E

The following learning standards listed in the 2000 *Mathematics Curriculum Framework* did not appear in the 1996 *Framework*. Some matrix-sampled questions on the 2001 test may test these standards; however, no student, school, or district scaled score or performance level results reported in 2001 will be generated based on those questions.

Grade 10

Number Sense and Operations

Learning Standard 10.N.2, regarding

- absolute value . . . $4\,|3 - 5| + 6 = 14$

All other parts of this learning standard will be tested in 2001.

Learning Standard 10.N.3.

- Find the approximate value for solutions to problems involving square roots and cube roots without the use of a calculator, e.g., $\sqrt{3^2 - 1} \approx 2.8$.

Patterns, Relations, and Algebra

Learning Standard 10.P.3, final sentence:

- Divide polynomials by monomials.

The first sentence of this learning standard, "Add, subtract, and multiply polynomials," will be tested in 2001.

Learning Standard 10.P.5, regarding

- completing the square, or using the quadratic formula

and

- Demonstrate an understanding of the equivalence of the methods.

All other parts of this learning standard will be tested in 2001.

Learning Standard 10.P.6, regarding

- absolute value of linear expressions (e.g., $|x - 2| > 5$)

All other parts of this learning standard will be tested in 2001.

Appendix E

Geometry

Learning Standard 10.G.8.

- Find linear equations that represent lines either perpendicular or parallel to a given line and through a point, e.g., by using the "point-slope" form of the equation.

Measurement

Learning Standard 10.M.2, regarding

- volume of . . . spheres.

All other parts of this learning standard will be tested in 2001.

Learning Standard 10.M.4.

- Describe the effects of approximate error in measurement and rounding on measurements and on computed values from measurements.

Appendix F

2000 *Science and Technology/Engineering Curriculum Framework* Learning Standards for Grades 3-5 Assessed by MCAS

2000 Science and Technology/Engineering Curriculum Framework

Learning Standards for Grades 3-5

Strand 1: Earth Science

1. Give a simple explanation of what a mineral is and some examples.
2. Identify the physical properties of minerals (hardness, color, luster, cleavage, and streak) and explain how minerals can be tested for these different physical properties.
3. Identify and explain the processes that help to determine the origin of metamorphic, igneous, and sedimentary rocks.
4. Explain and give examples of the ways in which soil is formed (the weathering of rock by water and wind and from the decomposition of plant and animal remains).
5. Recognize and discuss the different properties of soil, including color, texture (size of particles), the ability to retain water, and the ability to support the growth of plants.
6. Explain how air temperature, moisture, wind speed and direction, and precipitation make up the weather in a particular place and time.
7. Distinguish among the various forms of precipitation (rain, snow, sleet, and hail), making connections to the weather in a particular place and time.
8. Describe how global patterns such as the jet stream and water currents influence local weather in measurable terms such as temperature, wind direction and speed, and precipitation.
9. Differentiate between weather and climate.
10. Describe how water on earth cycles in different forms and in different locations, including underground and in the atmosphere.
11. Give examples of how the cycling of water, both in and out of the atmosphere, has an effect on climate.
12. Give examples of how the surface of the earth changes due to slow processes such as erosion and weathering, and rapid processes such as landslides, volcanic eruptions, and earthquakes.
13. Recognize that the earth is part of a system called the "solar system" that includes the sun (a star), planets, and many moons. The earth is the third planet from the sun in our solar system.
14. Recognize that the earth revolves around (orbits) the sun in a year's time and that the earth rotates on its axis once approximately every 24 hours. Make connections between the rotation of the earth and day/night, and the apparent movement of the sun, moon, and stars across the sky.
15. Describe the changes that occur in the observable shape of the moon over the course of a month.

Strand 2: Life Science

1. Classify plants and animals according to the characteristics that they share.
2. Identify the structures in plants that are responsible for food making, reproduction, growth, and protection.
3. Recognize that plants and animals go through predictable life cycles that include birth, growth, development, reproduction, and death.
4. Describe the major stages that characterize the life cycle of the frog and butterfly as they go through metamorphosis.
5. Differentiate between observed characteristics of plants and animals that are inherited (e.g., color of flower, shape of leaves, color of eyes, number of appendages) and characteristics that are not inherited (e.g., browning of leaves due to too much sun, ability to play soccer).
6. Give examples of how inherited characteristics may change over time due to changes in the environment.
7. Explain how the structures of living things (e.g., shape of beak or "feet," placement of eyes on head, length of neck) are adaptations to their environment that help them survive. Give examples of how change in the environment has caused some plants and animals to die or move to new locations.
8. Describe how organisms meet some of their needs in an environment by using behaviors (patterns of activities) in response to information (stimuli) received from the environment. Recognize that some animal behaviors are instinctive (e.g., turtles burying their eggs), and others are learned (e.g., humans building fires for warmth).
9. Recognize plant behaviors, such as the way seedlings grow with their stems upward and roots downward in response to gravity. Recognize that many plants and animals can survive harsh environments because of seasonal behaviors, e.g., in winter, trees shed leaves, some animals hibernate, and other animals migrate.
10. Give examples of how organisms can cause changes in their environment to ensure survival. Explain how some of these changes may affect the ecosystem.
11. Describe how energy from the sun is transferred within a food chain from producers to consumers to decomposers.

Strand 3: The Physical Sciences

1. Differentiate between properties of objects (e.g., size, shape, weight) and properties of materials (e.g., color, texture, hardness).
2. Compare and contrast solids, liquids, and gases based on the basic properties of each state of matter.
3. Describe how water can be changed from one state to another by adding or taking away heat.
4. Identify the basic forms of energy (light, sound, heat, electrical, and magnetic). Recognize that energy is the ability to cause motion or create change.
5. Give examples of how energy can be transferred from one form to another.
6. Recognize that electricity in circuits requires a complete loop through which an electrical current can pass, and that electricity can produce light, heat, and sound.
7. Identify and classify objects and materials that conduct electricity and objects and materials that are insulators of electricity.
8. Explain how electromagnets can be made and give examples of how they can be used.
9. Recognize that magnets have poles that repel and attract each other.
10. Identify and classify objects and materials that a magnet will attract and objects and materials that a magnet will not attract.
11. Recognize that sound is produced by vibrating objects and requires a medium through which to travel. Relate the rate of vibration to the pitch of the sound.
12. Recognize that light travels in a straight line until it strikes an object or travels from one medium to another, and that light can be reflected, refracted, and absorbed.

Strand 4: Technology/Engineering

1.1 Identify materials used to accomplish a design task based on a specific property, i.e., weight, strength, hardness, and flexibility.

1.2 Identify and explain the appropriate materials and tools (hammer, screwdriver, pliers, tape measure, screws, nails and other mechanical fasteners) to construct a given prototype safely.

1.3 Identify and explain the difference between simple and complex machines, i.e., hand can opener that includes multiple gears, wheel, wedge gear, and lever.

2.1 Identify a problem that reflects the need for shelter, storage, or convenience.

2.2 Describe different ways in which a problem can be represented, e.g., sketches, diagrams, graphic organizers, and lists.

2.3 Identify relevant design features (e.g., size, shape, weight) for building a prototype of a solution to a given problem.

2.4 Compare natural systems with mechanical systems that are designed to serve similar purposes, e.g., bird's wings as compared to an airplane's wings.

Appendix G

History and Social Science Curriculum Framework Learning Standards and Core Knowledge Topics Assessed by MCAS

History and Social Science Curriculum Framework
Learning Standards Assessed by MCAS

Strand One: History

1. **Chronology and Cause.** Students will understand the chronological order of historical events and recognize the complexity of historical cause and effect, including the interaction of forces from different spheres of human activity, the importance of ideas, and of individual choices, actions, and character.
2. **Historical Understanding.** Students will understand the meaning, implications, and import of historical events, while recognizing the contingency and unpredictability of history (how events could have taken other directions) by studying past ideas as they were thought, and past events as they were lived, by people of the time.
3. **Research, Evidence, and Point of View.** Students will acquire the ability to frame questions that can be answered by historical study and research; to collect, evaluate, and employ information from primary and secondary sources, and to apply it in oral and written presentations. They will understand the many kinds and uses of evidence; and by comparing competing historical narratives, they will differentiate historical fact from historical interpretation and from fiction.
4. **Society, Diversity, Commonality, and the Individual.** . . . Students should be expected to learn of the complex interplay that has existed from the beginning of our country between American ideals and American practice in the pursuit of realizing the goals of the Declaration of Independence for all people. While attending to the distinct contributions that immigrants from various lands and of various creeds, along with Native Americans, have made to our nationhood, students [will understand] the importance of our common citizenship and the imperative to treat all individuals with the respect for their dignity called for by the Declaration of Independence.
5. **Interdisciplinary Learning: Religion, Ethics, Philosophy, and Literature in History.** Students will describe and explain fundamental tenets of major world religions; basic ideals of ethics, including justice, consideration for others, and respect for human rights; differing conceptions of human nature; and influences over time of religion, ethics, and ideas of human nature in the arts, political and economic theories and ideologies, societal norms, education of the public, and the conduct of individual lives.
6. **Interdisciplinary Learning: Natural Science, Mathematics, and Technology in History.** Students will describe and explain major advances, discoveries, and inventions over time in natural science, mathematics, and technology; explain some of their effects and influences in the past and present on human life, thought, and health, including use of natural resources, production and distribution and consumption of goods, exploration, warfare, and communication.

Strand Two: Geography

7. **Physical Spaces of the Earth.** Students will describe the earth's natural features and their physical and biological characteristics; they will be able to visualize and map oceans and continents; mountain chains and rivers; forest, plain, and desert; resources both above and below ground; and conditions of climate and seasons.

8. **Places and Regions of the World.** Students will identify and explain the location and features of places and systems organized over time, including boundaries of nations and regions; cities and towns; capitals and commercial centers; roads, rails, and canals; dams, harbors, and fortifications; and routes of trade and invasion.

9. **The Effects of Geography.** Students will learn how physical environments have influenced particular cultures, economies, and political systems, and how geographic factors have affected population distribution, human migration, and other prehistoric and historical developments, such as agriculture, manufacturing, trade, and transportation.

10. **Human Alteration of Environments.** Students will describe the ways in which human activity has changed the world, such as removing natural barriers; transplanting some animal and plant species, and eliminating others; increasing or decreasing the fertility of land; and the mining of resources. They explain how science, technology, and institutions of many kinds have affected human capacity to alter environments.

Strand Three: Economics

11. **Fundamental Economic Concepts.** Students will understand fundamental economic concepts, including choice, ownership, exchange, cooperation, competition, purposive effect, entrepreneurship, incentive, and money . . .

12. **Economic Reasoning.** Students will demonstrate understanding of supply and demand, price, labor markets, the cost of capital, factors affecting production, distribution, and consumption, relations among such factors, the nature of goods and services, incentives, financial markets, cost-benefit (including marginal cost-benefit) analysis, fairness, and the value of trade . . .

13. **American and Massachusetts Economic History.** Students will describe the development of the American economy, including Massachusetts and New England, from colonial times to the present . . .

14. **Today's Economy.** Students will describe the distinctive aspects of the contemporary economy of the United States and the world . . .

15. **Theories of Economy.** Students will describe and compare the major theories of economy, and will identify the individuals and historical circumstances in which these theories were developed . . .

Strand Four: Civics and Government

16. **Authority, Responsibility, and Power.** Students will explain forms of authority in government and other institutions; explain purposes of authority and distinguish authority from mere power, as in "a government of laws, but not of men"; and describe responsible and irresponsible exercise of both authority and power.

17. **The Founding Documents.** Students will learn in progressively greater detail the content and history of the Founding Documents of the United States: the Declaration of Independence, United States Constitution, and selected *Federalist* papers (as required by the Massachusetts Education Reform Act of 1993). They will assess the reasoning, purposes, and effectiveness of the documents; and, similarly, elements of the Constitution of the Commonwealth of Massachusetts.

18. **Principles and Practices of American Government.** Students will describe how the United States government functions at the local, state, national, and international levels, with attention to the Constitution of the Commonwealth of Massachusetts, its Declaration of the Rights of the Inhabitants, and the basic elements of its Frame of Government; analyze the background and evolution of constitutional and democratic government in the United States to the present day; and explain the place of institutions of government in securing the rights of citizens.

19. **Citizenship.** Students will learn the rights and duties of citizens and the principle of equal rights for all; consider the nature of civic virtue in a school, a community, and a nation; and identify major obstacles and threats to civil rights.

20. **Forms of Government.** Students will study, compare, contrast, and analyze diverse forms of government; the ways of life and opportunities they permit, promote, and prohibit; and their effects on human rights. They will evaluate forms of government in terms of justice, ordered liberty, efficiency, public safety, educational opportunity, and economic and social mobility.

History and Social Science Curriculum Framework
Core Knowledge Topics Assessed by MCAS

The United States

1. Early America and the Americans (Beginnings to 1650)
    - a. The setting: geography and resources of the Western hemisphere
    - b. Native Americans: differing economics and politics; peace and war
    - c. Major European societies, rivalries; 15th and 16th century explorations
    - d. African geography, societies, politics; backgrounds of the slave trade
    - e. First encounters between Americans and Europeans; the consequences
    - f. Early English settlements and daily life in Massachusetts

2. Settlements, Colonies, and Emerging American Identity (1600 to 1763)
    - a. Political, religious, and economic motives of European colonizers
    - b. Coexistence and conflict between Europeans and Native Americans
    - c. Massachusetts town government, religion, and schooling in colonial times
    - d. Colonial era labor and the advent of North American slavery
    - e. Family life across classes, races, and regions of colonial America
    - f. Intellectual and religious heritage of Anglo-American colonials
    - g. Growing social and political divergence from England

3. The American Revolution: Creating a New Nation (1750 to 1815)
    - a. Events and interests behind the American Revolution
    - b. First battles in Massachusetts; the Declaration of Independence
    - c. Leaders, turning points, and deciding factors of the Revolutionary War
    - d. The Anglo-American political heritage: Greco-Roman history, Magna Carta, evolution of Parliament, Mayflower Compact, the English Revolution, colonial governments, and ideas of the Enlightenment era
    - e. Leading Founders, founding documents and debates: Adams, Hamilton, Jefferson, Madison; state constitutions, Articles of Confederation, Northwest Ordinance, Constitution, Federalists, Anti-Federalists, the Bill of Rights
    - f. The Constitution: the federal system at its origins; union; separation of powers; the three-fifths compromise
    - g. The early Republic: Washington as founding statesman; the birth of party politics
    - h. Expansion and conflict: the Louisiana Purchase; War of 1812

4. **Expansion, Reform, and Economic Growth** (1800 to 1861)
   a. Evolution of the Supreme Court; John Marshall; *Marbury v. Madison*
   b. Industrialization in New England; invention and enterprise
   c. The Northern economic system: capital, industry, labor, trade
   d. The Southern economic system: land, agriculture, slavery, trade
   e. Jacksonian Democracy and pre-Civil War reformers: popular politics, abolitionism, women's rights, and schooling
   f. The emergence of distinctly American religion, art, and literature
   g. New immigrants; migration patterns; nativist hostility
   h. Westward migration; Indian removals; war against Mexico

5. **The Civil War and Reconstruction** (1850 to 1877)
   a. Slave life; families, religion, and resistance in the American South
   b. A nation divided: the failed attempts at compromise over slavery
   c. Abraham Lincoln: beliefs, election; secession and war
   d. Scenes of war: battlefield, farm, factory, home, and hospital
   e. Massachusetts soldiers; Fort Wagner, the Wilderness
   f. Leaders, deciding factors, turning points, and human toll of the Civil War
   g. Emancipation Proclamation; the 13th, 14th, and 15th Amendments
   h. Lincoln's Gettysburg Address, Second Inaugural, and assassination
   i. Reconstruction: aims, obstacles, and phases

The World

1. **Human Beginnings and Early Civilizations** (Prehistory to 1000 B.C.)
   a. Human origins and early life; the work and findings of archaeologists
   b. Earth's geography: climate, soil, waters, topography, and human migration
   c. The agricultural revolution; Neolithic technology and its effects on human life
   d. Early civilizations in Mesopotamia, Egypt, China, India

2. **Classical Civilizations of the Ancient World** (1000 B.C. to c. 500 A.D.)
   a. Ancient Israelites; central teachings and legacies of Judaism
   b. Greek Civilization: literature, philosophy, arts, and science
   c. Athenian democracy: principles, practices, and legacy
   d. Alexander the Great and the spread of Hellenism
   e. Institutions, culture, and legacies of the Roman Republic and Empire
   f. The classical civilization of India; Hinduism, Buddhism
   g. The classical civilization of China; Confucianism, Taoism
   h. Origins, central teachings, and spread of Christianity
   i. The decline and fall of the Roman Empire; historians' debates

3. Growth of Agricultural and Commercial Civilizations (500 to 1500 A.D.)
    a. The Byzantine Empire: institutions, religion, and culture
    b. The origins and principles of Islam; spread of Muslim power
    c. Components of early European civilization: Roman, Christian, invaders
    d. Western feudalism, manorialism, religion; the three social estates
    e. The Middle Empire in China; trade and arts; Chinese Buddhism
    f. Japan's classical age; Shintoism, Buddhism, Sino-Japanese culture
    g. Kiev and Muscovy; Russia and the Mongol Empire
    h. Africa: cities and states; gold, salt, and slave trade; Muslim expansion
    i. Societies of pre-Columbian America: Mayan, Incan, Aztec
    j. Europe in the high Middle Ages; monarchs, parliaments, church, and culture

4. Emergence of a Global Age (1450 to 1750)
    a. The Italian Renaissance: economic, social, and political bases
    b. Works and legacies of Renaissance artists and humanists, South and North
    c. Leaders, ideas, contending forces, and religious change in the Reformation era
    d. China under Ming and Manchu dynasties; agriculture, trade, and cities
    e. Japanese unity under the Tokugawa Shogunate; the closing inward
    f. European expansion and exploration; economic and technological forces
    g. European conquests, colonization, and consequences in the Americas
    h. Absolute monarchies and constitutional governments

5. The Age of Revolutionary Change (1700 to 1914)
    a. The Scientific Revolution; earlier discoveries; new "laws" of nature
    b. The Enlightenment in Europe and America
    c. Origins, stages, and consequences of the American and French Revolutions
    d. Latin America; wars for independence; economic and social stratification
    e. Agricultural and Industrial Revolutions in the Western world
    f. Cities and urban life of the 19th century
    g. Democratic and social reform in Europe; evolutions and revolutions
    h. Rising European nationalism; motives for the new Western imperialism
    i. Chinese resistance to colonialism; the Chinese Revolution
    j. Japan's modernization and rise to world power
    k. Dawn of the 20th century; Western optimism and counter-currents

6. **The World in the Era of Great Wars (1900 to 1945)**
   a. World War I: causes, military course, and consequences
   b. The Russian Revolutions of 1917; ideas and practices of Bolsheviks
   c. Paris Conference, Versailles Treaty; aims and conflicts of divided Allies
   d. After-effects of war and colonialism, West and East
   e. The Great Depression: causes and worldwide consequences
   f. International Communism; Leninist/Stalinist totalitarianism in Russia
   g. International Fascism; Italy, Spain; Nazi totalitarianism in Germany
   h. Liberal democracies in danger; economic, social, and political crises
   i. Origins and responsibilities for World War II in Europe and Asia
   j. World War II: geography, leaders, military factors, and turning points
   k. The human toll of 20th century wars and genocides; the Holocaust

7. **The World from 1945 to the Present**[18]
   a. Origins of the Cold War; the divided victors of World War II
   b. Rebuilding and reform in postwar Europe and Japan
   c. New nations in Africa and Asia; the end of European colonialism
   d. Cold War in Europe; Marshall Plan; NATO; Iron Curtain, Warsaw Pact
   e. Cold War in Asia; Chinese Communist Revolution; wars in Korea and Vietnam
   f. East/West duels for the non-aligned: Asia, Africa, Central and South America
   g. The Soviet Empire collapses; post-Cold War locales of world disorder
   h. Persistent nationalism, militarism; conflicts of race, religion, and ethnicity
   i. Democracy and human rights; advances and retreats since 1945
   j. The changing world economy; limits on national sovereignty and priorities
   k. New boundaries and issues in science, technology, and culture

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[18] No common items will test students on events occurring after the collapse of the Soviet Union.